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ORIGINAL ARTICLES.

POLYURIA IN TYPHOID FEVER.[1]

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MURCHISON, in his chapter on typhoid fever, says the quantity of urine during the first week or ten days is usually diminished. Sometimes it falls to one-half, to one-quarter, or even to one-sixth of the normal standard, notwithstanding the increase of fluid ingesta. After the second week the quantity increases, and he has frequently observed the urine to be copious, pale and of low specific gravity, before the cessation of the fever. But in most cases the quantity does not increase greatly until convalescence, when the urine is almost invariably copious and of low specific gravity. At this period he has repeatedly known as many as eighty or ninety fluid ounces passed in the twenty-four hours.

Arnould, in *Dictionaire des Sciences Medicales*, says the quantity of urine is almost always diminished, sometimes it is more abundant, and there may be a veritable polyuria; this may be a symptom preceding the defervescence. During convalescence the urine may vary between 1,500 c.c. in moderate forms of fever, and 1,700 c.c. in severe forms; this polyuria coincides with the more abundant excretion of the solid material of the urine. There is intimate relation between the function of the kidneys and the skin. When the patient is convalescent the polyuria corresponds with the abundant sweats; on the contrary, a dry skin and diminution of the urine is a grave sign.

One of the latest expressions on this subject is by Olser, who says: "An unusual increase of urine during the progress of convalescence is by no means a rare manifestation, so that the amount may reach 10,000 c.c. and more, in twenty-four hours. The urine is then remarkably light, as clear as water, and of exceedingly low specific gravity down to 1,002. Rarely, and then especially in nervous persons, women as well as men, this polyuria may be apparent as early as the latter portion of the febrile period."

Practically all authors of text-books are satisfied with the remark that the urine is scanty and of high specific gravity during the height of the fever, and more abundant, and of lower specific gravity toward and during convalescence. Some authors say that a convalescence can be practically foretold by an increase in the amount of urine of low specific gravity.

Under the caption, "Polyuria in Typhoid Fever," we could discover only one article, though isolated cases have been reported and not published. Dr. J. C. Wilson, of Philadelphia, reported a case of polyuria in typhoid fever at the Section of Medicine of the College of Physicians of Philadelphia, and will speak of his case in connection with this paper.

Spitz reported in 1882, under the caption, "Polyuria in Typhoid Fever," a case in a patient who had a severe attack of typhoid, who passed 6,000 to 8,000 c.c. of urine daily during convalescence. After this observation he had the daily amount of urine of all cases of typhoid fever measured, and it was found that in about one-half of the cases, polyuria was present in convalescence, he considering anything over 2,000 c.c. as a polyuria. The urine was always bright yellow, free from albumin and sugar and without any sediment; it was of low specific gravity, so that it consisted mainly of water.

He concludes: (1) In convalescence of typhoid fever polyuria is present in one-half of the cases; (2) the amount of urine may be increased by artificial means during severe high temperatures; (3) the increase of the amount of urine is most common in the sixth week; (4) the increase in the amount of urine is not due to any organic disease.

The case which we desire to report is as follows:

Case.—Charles S., married, aged forty years, admitted to St. Timothy's Hospital April 15, 1903, on about the eighth day of typhoid fever. The temperatures on admission was 103° F. It remained between 102° and 103° F. until May 4, when convalescence began.

On May 8 the temperature was normal and remained so until his discharge from the hospital. He was extremely nervous through the entire course of the disease. On April 23, eight days after admission, he had a slight intestinal hemorrhage which had apparently no effect on the course of the disease. He was taking five grains of salol every three hours on admission, and continued this drug until April 19 (four days), when it was stopped. The first twenty-four hours after admission he passed about 1,200 c.c. of urine. The second twenty-four hours he passed about the same amount. On April 18, or the third day after admission, he passed seven quarts and nine ounces (7,000 c.c.). The next day, seven quarts and eighteen ounces (7,200 c.c.). During this period he was nervous, but not so markedly as later, when he was passing much less urine; he was extremely thirsty, and drank water every

[1] Read before the Association of American Physicians, Washington, D. C., May 10, 1904.

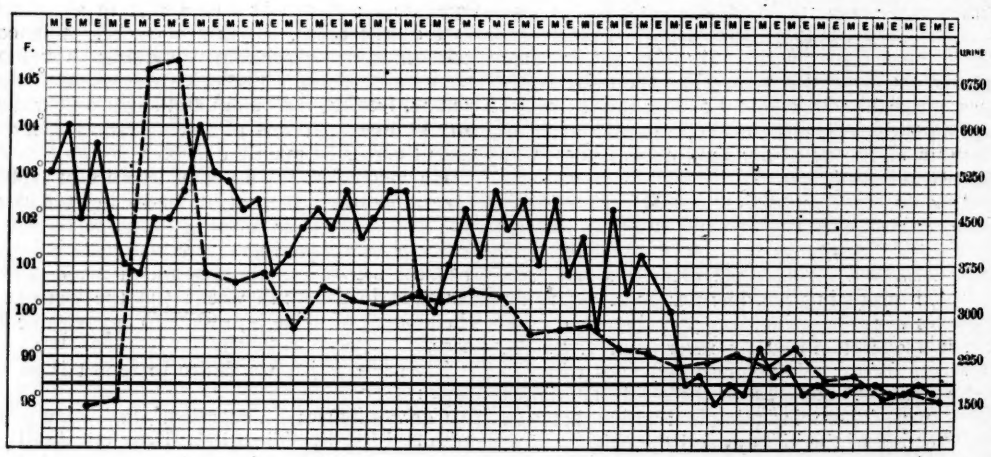
few minutes, and passed his urine at very short intervals, in amounts varying from ten to twelve ounces. At this time the polyuria amounted to a veritable complication, on account of the loss of rest and the nervous excitement which it entailed. His skin was dry, and he was restless. He drank much water after the polyuria began. It was not measured. As the polyuria diminished the thirst became less marked; the increased consumption of water appeared to be the result, rather than the cause of the polyuria.

On the following day (April 20), the urine dropped to about four quarts, and remained between three and four quarts (3,000 to 4,000 c.c.) for two days. In the next ten days he passed between two and three quarts in twenty-four hours, and passed about the normal amount on May 13, or almost one month after his admission to the hospital. During this period, April 15 until May 6, his temperature ranged between 104° F., and normal, but during the greater part of the period was not below 102° F., except as the result of sponges. From May 6 to 14, when his temperature was normal, he passed between two and three quarts of urine daily.

It will be seen, then, Fig. 1, that during the height of the fever he had a veritable polyuria, and as the temperature reached normal he passed decidedly *less* urine. When his polyuria was most extreme the urine had a specific gravity of 1,002. On the first day it contained a trace of salicylic acid, as shown by the iron test, but only on that day; it contained neither albumin nor sugar, no acetone, and no diacetic acid, there was .004 grams of urea, to 1 c.c. of urine, or 4 per cent. He thus passed 28.8 grams of urea, which is not far from normal. As the specific gravity rose and the quantity of urea decreased, the urea percentage rose; he thus at all times passed about a normal percentage of urea. When the amount of his urine fell to three quarts the specific gravity rose to 1,010, and remained at about 1,010 until convalescence was fully established. At no time was there any albumin or sugar or at any time were there any formed elements. On April 11, 1904, one year after the typhoid fever, an examination of the urine was made and it was found to be absolutely normal. He is in perfect health. On three days, April 23, 24, 25, 1904, he passed respectively, 41½, 41¾ and 43½ fluid ounces of urine. On April 26, 27, 1904 (that is, just one year after his attack), he was given five grains of salol every three hours, and passed on each day 54 ounces and 52 ounces respectively, specific gravity 1,026 —otherwise negative, containing 2 per cent. urea.

On reviewing this case it will be seen that it differs from practically all of the cases of polyuria in typhoid fever mentioned by writers, in the fact that the polyuria began suddenly in the second week of the disease, and that the urine was

Fig. 1.



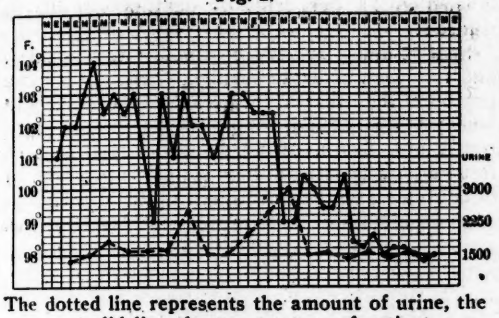
The dotted line represents the amount of urine, the solid line the temperature of patient.

greatest in amount during the height of the fever, and declined as convalescence began, and when convalescence was established the urine was absolutely normal in quantity and in character.

The polyuria spoken of by authors occurs just before, or during convalescence. In order to compare the amount of urine passed in this case with the amount passed in the ordinary case of typhoid, we have selected two cases of typhoid in which the urine was measured daily. In the patient (Ed. Dowling), chart 3, where daily measurement was made for four weeks, the urine never rose above 62 ounces in the twenty-four hours, and was often as low as twelve ounces. In only one other patient beside the one quoted in this series of 180 cases was there any excessive amount of urine passed during the height of the fever, and in that case it did not rise above 3,000 c.c., chart 2, in twenty-four hours. The amounts passed in this case will be seen by the chart, together with the range of temperature.

We have gone over the records of a series of cases in St. Timothy's Hospital with a view of proving the frequency with which polyuria occurred during the course, or in the convalescence of typhoid fever, and in 180 cases in which the urine was measured every day, we have discovered only 22 in which the urine was 2,000 c.c. or over, and in only one of these, the one above reported, was the polyuria constant from the beginning of the disease, and in no other case except this was there a very excessive amount, 3,000 c.c., being the limit.

Fig. 2.



The dotted line represents the amount of urine, the solid line the temperature of patient.

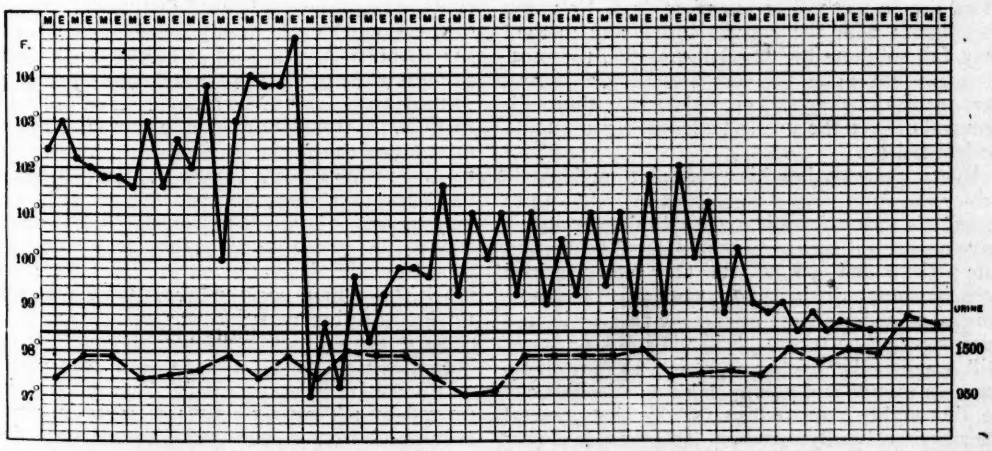
In the great majority of the cases it was scanty during the height of the fever, and rose only during convalescence; if, therefore, this series is reliable, and the measurements were made without any thought of the subject of polyuria, it would seem that the incidence of polyuria in convalescence is not nearly as common as most writers think, only eight per cent. of our cases showed a polyuria at any time, instead of 50 per cent., as Spitz has stated in his paper, or instead of being almost without exception in convalescence, as stated by Murchison.

As to the cause of the polyuria existing in this most remarkable case which we have reported, it was certainly not due to a pre-existing diabetes on admission, as for two days the amount of urine was normal, it fell to normal with convalescence, and has probably remained so ever since, as it certainly is as stated above at the present writing. It was not due to any organic condition of the kidneys, because the urine has always been, even during the existence of the passage of a great amount, normal so far as albumin and formed elements are concerned.

There would seem to remain of the ordinary causes of polyuria but two, the administration of salol, and the nervous condition of the patient. The salol was stopped on the second day of polyuria, but the abnormal amount of urine continued for almost one month after the discontinuance of the drug. It seems scarcely possible, therefore, that the salol could have been the causative factor. The patient was nervous, it is true, but when he was passing the greatest amount of urine he was much less nervous, than later when he was passing from three to four quarts.

The patient was not given the bath treatment. He was under treatment in a private room, and by direction of his physician was sponged at the temperature of 103° F. or over. It is quite within the range of possibility that these cold sponges may have had something to do with the polyuria, but it seems scarcely possible, because he received eleven sponges before the polyuria developed, and the condition continued eleven days after the sponges were stopped, although in gradually diminishing amount.

Fig. 3.



The dotted line represents the amount of urine, the solid line the temperature of patient.

As to the cause of polyuria in general this paper cannot deal. The most common causes given by authorities, however, are nervousness and some organic change, either in the nervous system, or in the kidneys themselves. Certainly the last two were not active in this case, and it would seem that the unusual amount of urine

was caused either by the very moderate use of cold water, or by the unusual and continued nervous, almost hysterical, condition of the patient.

We conclude: (1) That the urine during the course of typhoid fever is usually of high specific gravity and in amount below 1,500 c.c. in twenty-four hours. (2) In convalescence the amount of urine may rise in a small percentage of cases to 2,000, or even to 10,000 c.c. in twenty-four hours. (3) That in very rare cases there may be at times polyuria of from 3,000 to 8,000 c.c. in the twenty-four hours during the entire course of the disease.

TREATMENT OF ACUTE MIDDLE-EAR DISEASE.[1]

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IF it were not for the constant demand on every physician, specialist or not, to treat this most common disease, the great suffering of the patient and the bad sequelæ so frequently occurring from its nearly equally common mistreatment or neglect, I would not have selected this subject.

I omit its general pathology, assuming you are already familiar with it. Acute otitis (I will make no anatomical classifications) occurs most frequently in children, and nearly always follows some irritated condition of nasal pharynx; of these, the earliest and most common is adenoids, which should be looked for in all cases. The most simple method of examination is by using the finger; with the inexperienced, any method may fail to show the smaller growths, the most frequent but none the less annoying. If any ear or catarrhal symptom exists, the thorough removal of even the smallest adenoid tissue should be insisted on.

Every operator has his preferable method. I prefer the curet, finger nail, or nail curet. As to anesthetic, chloroform is extremely dangerous. I have on several occasions been obliged to resuscitate patients and operate after they have regained consciousness. This has occurred when the most careful physicians were giving the anesthetic, and every precaution taken. Ether is safer, or better still, some of the quicker ones, *e.g.*, nitrous oxide, etc. In infants and young children, adenoids can be thoroughly removed so rapidly that general anesthesia is hardly necessary, and there is almost no pain afterward. In older children and adults, cocaine may be used; in fact, a single application of 5 per cent. in young children may be safely used, and lessens the pain. In every case, thorough work is essential for the best results.

The next most frequent cause, and a condition usually accompanying this, is enlarged tonsils. They should be entirely removed, or as much removed as possible. This is only accompanied by seizing the tonsil with a good forcep (after trying many, I prefer Peter's), then, after separating the pillars, cut off with scissors, snare or tonsillotome. For this cocaine is safer, but many patients resent the combined operation without general anesthesia.

After these are the acute diseases, as scarlet fever, diphtheria, measles, etc. In measles, according to Bezold, the middle ear is injected early; post-mortems demonstrated this condition in many cases, with no symptoms observed in life. Quoting from Dr. D. T. Vail's paper, he says: "It is claimed, 4 per cent. of deafness is due to measles."

Scarlet fever is very commonly accompanied, and followed, by acute purulent otitis. It is more profound than that of measles, and more likely to bone necrosis, cranial complications, general septicemia and death, or permanent impairment of hearing. The same author states 19 per cent. of deaf mutes owe their condition to this cause.

In diphtheria, it is quite frequent, but hardly as severe. Influenza is sometimes accompanied by small hemorrhagic bullæ on upper part of drum, which rupture early. Suppuration and mastoid abscess is very common during epidemics of this disease. Other causes are brain disease, typhus, smallpox, chickenpox, erysipelas, whooping-cough, mumps, pneumonia, rickets, tuberculosis, syphilis, etc. The multiple perforation in early stages of tuberculous diseases is a decided aid in its diagnosis.

Having already mentioned the prophylactic treatment in adenoid conditions, it must not be overlooked in these other diseases, but more especially scarlatina, measles and diphtheria. In each of these, and in fact in any inflamed condition of the nasopharynx, a mild antiseptic wash would prevent many of the disagreeable accompaniments of the disease, and avoid many cases of otitis. In fact, R. E. Lander, of Southampton, England, after a vast range of experience with scarlet fever, reports in the *Lancet*, March 12, facts that make us believe our long-cherished dream of the contagious scales is about to vanish, for of patients leaving in two weeks, having had noses and throats made clean, the return cases were very much fewer than occurred from those who were retained till desquamation was complete.

As to the solution, a mixture of equal parts of borax, salt and soda, a teaspoonful to a pint of warm water, is very useful. This may be improved by adding six drams of glycerin, and if required to be more germicidal, formalin, say four to eight drops (the glycerin prevents its irritating action). To this, menthol, thymol, etc., may be added as desired, but pharmacists usually do not succeed in mixing them satisfactorily. These essential qualities are combined in thymoglycerin compound or Pynchon's Dobel solution, which, when diluted, one ounce to the pint, gives a solution somewhat similar to the above, combining the therapeutic and antiseptic effect of menthol and thymol. Glyco-thymolin, borolyptol, listerine and other similar preparations are all useful, and it becomes largely a matter of individual choice. The formula given contains alka-

[1] Read before the Montana State Medical Association, Butte, Mont., May 18, 1904.

line salts in about the same proportion, and has a specific gravity much similar to blood serum when diluted.

As to the method of use, a simple glass douche is convenient, but ear diseases may follow it, though with proper care this should not occur. Putting not over a teaspoonful in the hand and snuffing it up is probably the safest, but it is difficult to get children to do this. When this is done by first holding the hand two or three feet from the floor, stooping to draw it up, then while still holding the nose in the hand and, raising the head, allowing the fluid to flow back to the pharynx, complete cleansing is accomplished. In children, it may be put into the nostrils by saturating cotton, then squeezing it, or with a dropper or spoon.

An atomizer, possibly, is the more likely to be used. Unfortunately, since the poorest atomizers are retailed at about the price of the best, and at much larger profit, the patient not being able to select, usually gets an inferior one. The De Vilbiss No. 16 and Century Nos. 10 and 50 have two bottles, and use oil and water, both always at hand. The De Vilbiss throws a spray or stream, as desired, in any direction, has metal trimmings, and is therefore easily cleaned. The Whitall Tatum, Nos. 30 and 33, have given me good satisfaction, also. The first two firms, and I think any first-class makers, will replace any defective goods. The physician should select one or more good ones, and stick to them, as patients never appreciate prescriptions for ones that do not work. The druggist does not care to carry great varieties of perishable rubber goods, therefore he should be informed of your choice.

Usually the first manifest symptom of acute otitis is pain. In infants, this is frequently overlooked; many develop meningitis before it is suspected. All infants should be carefully watched for manifest signs of earache. In adults, a diagnosis is easily made. Active treatment consists of relieving pain, endeavoring to avoid suppuration and other complications. Heat is the first remedy.

I advise a large fountain syringe filled with water as hot as can be borne, held about three to six inches above the ear, the water flowing into the ear through a return-flow ear douche emptying into a basin. The canal is then dried and filled with phenol, m. 50; glycerin, 1 oz., which is left in. This should be repeated every two to six hours, according to amout of pain. Take cocaine hyd., grs. 6 to 10; absolute alcohol, drams 1; aniline pure, drams 1; four or five drops in ear, repeated each hour till pain is relieved, is more effective, but much more dangerous. Both have a dehydrating action, which is much to be desired. Dr. Richards gives a formulæ: take phenol, m. 7; F. E. opii, m. 6; cocaine, grs. 3; atroph. sulph., grs. 3; aqua, m. 52; gelatin, grs. 18; glycerin, m. 158; M. S. Make 42 bougies. These have the advantage of convenience, safety, permanency and efficiency.

When pain persists after twelve to twenty-four hours of such treatment, I employ drainage. Formerly, I made free incision at this time into the drum, opening it from bottom upward very freely. For this, the cocaine, aniline oil and alcohol preparation is useful, but nearly always considerable pain persists.

Since selecting the title of this paper, I have in several cases used a method advised by Hazen in his little book, "New Findings," *i.e.*, the Eustachian catheter. He claims that the return flow of air carries out fluid secretions and relieves congestion. I use air hot as can be borne through the catheter, and in the few cases so far, results have been very gratifying. The Politzer method of inflation is injurious in this condition. After free incision has been made, the canal, having previously been cleaned, is now lightly packed with sterilized gauze, loose enough to afford drainage. If the opening has been made the first or second day, the discharge is likely serious, and an effort is made to keep it so, by free drainage and avoiding infection. Outside this gauze in the canal is placed a large gauze or cotton pad, sufficient to absorb all discharge reaching it. This outer pad is changed whenever it becomes damp; that in the canal is left twenty-four hours.

If the operation be done within the first forty-eight hours, a few days to a week or two is usually all the time required for healing; if done later, the time is considerably lengthened. If mastoid trouble develops and continues after the ear drum is freely opened, the bone should be opened. Free opening into the antrum and removal of all diseased bone, wherever found, under careful inspection in good light, should always be done. Follow the diseased tissue everywhere, irrespective of its location and dangers. Deaths from neglect to do this far exceed the possibilities of accidents in operating.

Conclusions.—1. In all diseases affecting the nasopharynx, always use reasonable precautions to avoid tubal infections.

2. Adenoid tissue, in any amount, and tonsils producing any pathological symptoms, should always be removed.

3. With the first symptoms of earache, use heat and dehydrating remedies; this not producing beneficial results in a few hours, treat surgically.

4. When possible, with a catheter use mild continuous stream of hot air early, and repeat in eight or ten hours.

5. If symptoms are not relieved by these methods within ten to twenty-four hours, make free incision through the entire drum, or extend into upper canal wall if necessary. Use aseptic gauze drainage and outside pad for absorption.

6. Never under any conditions allow the patient to suffer tortures for more than forty-eight hours and remain exposed to the risks of complications.

N. B.—Considerable experience with the catheter treatment, since writing the above, fully confirms the original hopeful anticipations, and has very much lessened the number of cases requiring opening of the drum.

THE VALUE OF EARLY INCISION OF THE MEMBRANA TYMPANI IN THE TREATMENT OF ACUTE SUPPURATION OF THE MIDDLE EAR.[1]

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ALTHOUGH my subject may seem a somewhat hackneyed topic to venture upon before such an audience, I have chosen it for the reason that I believe wherever a man's personal experience has proved of value to himself it may also prove of some service to others.

In Philadelphia, during the months of February and March of the present year, there was a marked increase in the number of cases of acute suppurative otitis media, occurring in conjunction with attacks of grip. As is so often the case in epidemics of grip, the complications not only were of the same general character, in this instance, largely aural, but also presented certain very definite individual peculiarities. Thus, the suppurative process developed with great rapidity, as a rule the abscess pointed and ruptured within twelve or fourteen hours after the onset of the pain in the ear. The discharge which ensued was at first very scanty, usually blood-streaked, but soon became very profuse. The pain continued to be intense for some days after the rupture of the drum occurred, in spite of free drainage of the pus from the middle ear. It was always worse in the afternoon, the patient being comparatively comfortable until that time.

In many cases pointing of the abscess and spontaneous rupture of the drum membrane occurred with such rapidity that the patient was not seen until subsequent to the appearance of the discharge. The cases to which the writer would particularly draw your attention were all of them observed and treated by him personally throughout their course. There were other cases occurring in his hospital service which he did not have the opportunity to follow up so thoroughly, but from the reports of his assistants these bear out the statements made concerning the twelve cases which are here presented.

In seven instances in the author's experience in which spontaneous rupture occurred, the patient suffered much pain in the ear for many days after the rupture had happened, and the discharge continued in two instances as long as four weeks, and in the other five for periods varying between ten days and three weeks. In three cases, in which early incision was practised, there was almost instantaneous relief from pain, and the discharge had ceased, in one instance, at the end of three days, and in the other two at the end of five.

After the drum membrane had been opened, whether spontaneously or with the knife, the same plan of treatment was pursued in all twelve cases. This consisted in a thorough cleansing of the ear once daily by mopping out with peroxide of hydrogen, full strength, applied on cotton pledgets, followed when the discharge was very profuse by injecting a few small syringes full of bichloride of mercury 1 to 4,000 solution. After thoroughly drying, a wick of iodoform gauze was introduced throughout the whole length of the canal, and left in position until the next day, the nurse or patient being given instructions to remove it if there were any evidence of it damming up the pus. I believe that drainage procured by this method is the most efficient means of avoiding stagnation of the discharge, pain and mastoid involvement.

When the pain was very great at the time that the dressing was done, I found that great comfort was given the patient if after cleansing the ear and drying it, an anesthetic mixture consisting of five parts of a 10 per cent. solution of cocaine, combined with 50 parts of anilin oil, and 50 parts of 5 per cent. of alcohol was instilled. This was allowed to remain in the ear for a few moments and mopped out before the insertion of the gauze drain. In two instances in which this mixture was used the patients' temperatures became subnormal, and they were very deeply cyanosed, the blueness lasting for several days. As a case of death has been reported occurring from the use of this mixture, it should be employed with considerable caution. Both the author's cases recovered without further interference. The gauze drain not only afforded relief by drawing off the pus, but the patients all seem to experience a sense of comfort, apparently because, as they expressed it in several instances, "it kept the walls of the canal apart."

The cases which the author observed would seem to him to have emphasized the following points in the treatment of acute suppurative otitis media. First, the great value of early incision of the membrana tympani. Second, the many advantages possessed by the so-called dry treatment, and by practising efficient gauze drainage. I believe that douching out the ear by the patient or nurse is distinctly contraindicated from the fact that no one but a skilled aurist can properly dry the ear after such procedures, and that the little pool of fluid which is left is very harmful in that it affords moisture for the furtherance of bacterial growth.

[1] Read by title at the meeting of the American Laryngological, Rhinological and Otological Society, June, 1904.

Nitrogen Necessary for Life.—The atmosphere is composed of a mixture of oxygen and nitrogen, the former substance being esential to life. It has been a matter of scientific speculation, however, what part is played by the nitrogen, and whether it could be supplanted by hydrogen. Professor Marcacci, of Palermo, Italy, has recently shown that in an atmosphere artificially constructed with an equal amount of hydrogen substituted for the nitrogen, that life cannot be supported for any length of time. Professor Marcacci tried to keep animals in such an atmosphere, but he found that they soon died, the same effects being noticed as would result from cold. This is explained by the fact that hydrogen possesses greater conductivity for heat than nitrogen.

CONTRIBUTIONS TO THE PATHOLOGY AND TREATMENT OF ACUTE GONORRHEA.

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FORMERLY when the causative factor of gonorrhea was unknown, temporizing during the active stage and suppression of the discharge by astringents formed the main aim of treatment. By dint of some presentment of an etiological cause, the antiseptic astringents, especially the nitrate of silver, were employed, and as we all know with excellent results. But its microbicidal action was at times superseded by its irritating astringent properties, which are undesirable in the acute stage. Klotz,[78] however, recently advocates retrograde injections of two per cent. solutions of nitrate of silver. The untimely use of astringents in the first stage of acute gonorrhea by retarding phagocytosis would frustrate Nature's endeavors to flood out the gonococci. Not the cessation of the discharge by astringents should be our aim at this period, but the dislodgement and possible annihilation of the gonococcus by microbicides. Hence the injunction of old writers not to suppress the discharge too quickly. Their fear of a "gonorrhea sicca" as causing systemic complications was founded on broad experience, and, as usual, an excellent observation. On the lines defined by Neisser, to treat gonorrhea on etiological principles only, can success be achieved in the strenuous battle against this loathsome disease. We may probably not succeed to attain absolutely what we strive for; the gonococcus may even under the etiological treatment with the new silver compounds occasionally invade the deeper tissues and give rise to latent processes and complications, but with no other mode of treatment will such an occurrence be less frequent than with the etiological treatment of gonorrhea.

In order to exclude the irritating and caustic effect of nitrate of silver without dispensing with its eminently bactericidal properties, there have been devised of late silver compounds, known as silver albuminates, containing silver in organic combinations. They have in common the property of not being precipitated by chlorides and albuminates in the secretions.

The first of the series was argonin, a silver casein compound, containing 4.2 per cent. of silver; next largin, a paranuclein proteid, with 11.1 per cent. of silver; followed by protargol, with 8.3 per cent. of silver, and argyrol, a silver vitellin produced from the proteid derived from wheat, with 30 per cent. of silver.

In another group of preparations, by combining the nitrate of silver with various substances combinations were produced in which the silver is contained in a form resembling a salt, and these among others are argentamine, with 10 per cent. albargin, a gelatose silver, with 23.6 per cent. ichthargon, ichthyol-sulphonic acid, with 30 per cent. nitrate of silver. Their virtues are extolled on different scores. For instance, in albargin the silver is loosely combined with the proteid, which I cannot regard as an advantage, as maintained by Bornemann,[79] as it is apt to be precipitated too soon, before coming in intimate contact with the mucous membrane.

Much importance is of late being attached by exploiters of some of these preparations as to their ability to dialyze, and from these laboratory experiments a higher penetrative power has been deduced. Their diffusibility through animal membranes—through dead ones—is correct; but the urethral mucosa is a living membrane, and a very active one. Haidenhain has conclusively shown that living mucous membranes do not permit of dialyzation or osmosis. My own investigations corroborate this point. Whether a preparation dialyzes or not through dead membranes in laboratory experiments makes no difference; nothing diffuses through living membrances. Not the slightest demonstrable trace of silver could be detected in the deep epithelial strata when experimenting with any of these preparations, so that in respect to penetrating power in the living mucous membrane, they stand alike, *i.e.*, nil.

The experiments made by Schaeffer with argentamine, by Benario[80] with protargol, by Aufrecht with ichthargan, and by Martin with argyrol, were all faulty in conception, and therefore useless. They used dead liver tissue, and not even dead urethral mucosa. Martin,[81] in order to show the penetrative power of argyrol, employed strands of catgut. From the more or less deep impregnation of these tissues they sought to prove the power of penetration of these remedies. Dr. Edwin C. Burnett,[82] at the Association of Genito-Urinary Surgeons, Washington, May 12, 1903, found in his experiments on the living urethras of dogs and rabbits, by using a 1 to 5 per cent. argyrol solution, that it penetrated only the upper surface of the top layer of cells. These correspond with the investigations carried on by me and Dr. Henry Kreuder, of New York, in the latter's laboratory, the results of which will be published in detail elsewhere.

The living cell will absorb crystalloids like iodide of potassium, but is impermeable to mineral or colloid substances, of which the silver salts are made. Neither does the fact so vividly emphasized by Neisser, that these preparations, because they are not precipitated by the normal tissue fluids, as is silver nitrate, secure for them the virtue of possessing penetrative power. Neither of these two physiochemical conditions enables them to be absorbed by the living membrane. Penetration in the living membrane takes place by absorption, in the dead tissue through imbibition.

As to the bactericidal and antiseptic power, laboratory experiments, although not exactly reproducing conditions as they exist in living tissues, are of somewhat more value. As to these,

properties there are differences among them, as will be shown elsewhere.

On account of their large percentage of silver (23 to 30 per cent.) albargin, ichthargon, and argyrol, are said to possess a more pronounced germicidal power than the other silver albumin preparations. Metallic silver is inert. In its chemical combination with nitric acid it yields the well-known nitrate of silver, justly held in high estimation by everyone. Porosz[83] and others think its action due to the liberated nitric acid. But these new proteid silver preparations are devoid of any chemical formula. Their existential idea is based on the anticipated conclusion that in combining silver with a proteid body, more or less homogeneous to the tissues, such a combination will, thanks to its unirritating properties, permit of a longer contact with the tissues, and allow of a diffusion through the cell textures. The wish here is the father of the thought. In every instance where any of these newer silver preparations has been lauded a high penetrative power has been attributed to it. It seems to have been a foregone conclusion that because a combination is of only slightly alkaline reaction, and because it contains so much silver, and because it is combined with some of the many proteid derivatives, such a loose unchemical mixture will at once upset the laws of physiology by rendering living membranes permeable to colloids because in a laboratory experiment dialyzation through dead animal membranes has taken place. A high percentage of silver is no indication of a greater gonocidal power, since compounds weak in silver have proved as effective in eradicating the gonococcus as other silver combinations containing much larger amounts, and which are employed in strong solutions. A very unpleasant feature of argyrol is its staining effect, and not only for cosmetic reasons, but also for its telltale nature, which is an objectionable quality for a drug used in this "secret" disease.

In my service at the German Polyclinic I have made control experiments for the purpose of determining the comparative irritation between protargol, in one-half to three-quarters per cent. solution, and argyrol in two to five per cent. Although the patients were not apprised of our intentions they invariably complained of some irritation when argyrol was used in from two to five per cent. In both instances some sensations of irritation were complained of. My own observations as to the possibility of irritation from argyrol are confirmed by some references to this point in the literature. In two cases the patients brought small dark gelatinous masses looking like "liver," which they had voided when urinating. The injection with argyrol was made four hours before, and the patients had not urinated since. Examination of this mass revealed argyrol in a congealed condition. This was proven by dissolving it in distilled water and adding ammonium sulphide. A precipitate of silver sulphide took place promptly.

As to protargol, Neisser, on the strength of Benario's investigations[84] after previous extended trial in his clinic, published his first report in 1897.[85] His excellent results were soon confirmed. I have dwelt extensively at an earlier period on protargol medication in several communications,[86] and will not attempt here even to partially enumerate the enormous literature which has accumulated since then.

Protargol is certainly the best studied of all the antigonorrhoics, having stood the test of time and being most extensively employed; and having in the greatest majority of cases yielded the best results, one is justified in drawing definite conclusions regarding it. Under its use complications have been avoided in a larger number of cases than with other preparations of its kind. Already in my earlier communications I attributed some astringent properties to protargol which were doubted by Frank.[87] I have since found that in the stronger solutions it certainly exerts such an influence, and Grossglick[88] also presumes this to be the case. Since astringent properties are desirable only in the second stage of gonorrhea to diminish the discharge and to combat the lesions due to the gonococci, and as these stronger solutions, 1½ to 4 per cent., are used only in the defervescing period of the process, it will here act as an antiseptic astringent, a property of protargol that has not yet been referred to, and to which I would like to draw attention.

Individualization.—Writers on the treatment of gonorrhea usually impart the advice not to generalize, but to treat each case as befits its condition. But outside of generalities we are not told how to do this. This is due to the circumstance that the pathology of gonorrhea—autopsies being of extremely rare occurrence—does not explain the clinical symptoms precisely enough to indicate what should be done or left undone under certain special pathological conditions. Therefore a certain amount of generalization will always be necessary, and we will have to individualize as best we can. The following is but a modest endeavor of individualization which I am in the habit of pursuing.

1. *As to the General Health of the Patient.*—The natural power of defense and the degree of such power is variable in different individuals. The so-called diathesis, for want of a better expression, undoubtedly plays a great rôle in gonorrhea also. In the lymphatic, gouty, diabetic, and in those afflicted with syphilis the acute gonorrheal process may run a course of different grades of severity, but it will usually be of longer duration and more prone to complications than in those untainted. I think this to be due to defective leucocytosis as a manifestation of a weakened repelling power of the system. The leucocytes may be so altered in their chemical, and probably in their minutest, as yet unrecognized, histological composition, that they do not, as is normally the case, present suitable nutrient media to the gonococci. They will not ingulf them, and the gonococci, in a large proportion at least, re-

main free outside the cells. In the discharge of such patients we will observe certain peculiarities which may be conveniently subsummarized as follows:

Scanty discharge; poor in serum, proportionately well supplied with leucocytes, but gonococci mostly outside of them; or abundant discharge; rich in serum, poor in leucocytes, and gonococci also mostly outside; in both conditions the toxins which the gonococci elaborate will have been only partially neutralized by deficient phagocytosis. The progress of the gonococci having been thus only incompletely checked they will invade the deeper structures and, exerting their deleterious influence, will cause complications to occur near and remote. This deficient phagocytosis will promote also a permanency and longevity of the gonococci. Furthermore, we know that the gonococci elaborate toxins, that is, products of their own metabolism; these toxins are in part neutralized by the leucocytes, provided they are present in sufficient quality and quantity, and partly will these toxins serve to destroy the gonococci themselves. They are destined to perish by their own toxins. Such is the case when the discharge possesses necessary conquering qualities, but in debilitated subjects these conditions will be found more or less altered and the process prone to become systemic.

Our aim, therefore, will be to establish, by all available means, a satisfactory discharge, trying to promote a local leucocytosis. Attempts have been made by Dehio to create such in lupus patients by a subcutaneous injection of the proteins of the *Bacillus prodigiosus* and *Bacillus pyocyaneus*. The tuberculin and antistreptococcus serum, etc., are employed on this same principle. Even speculative pharmacy has philanthropically introduced preparations of nuclein and nucleo-albumins for this purpose, but without effect. If we get such a case with the above-mentioned characteristic microscopical evidences within thirty-six hours after exposure, abortive treatment should be tried at once. In this condition I prefer to use nitrate of silver, which by its irritative power gives the best chance for augmented leucocytosis. But if a patient of this class presents himself later than thirty-six hours, but not longer than four to eight days after exposure, I resort to what I call heroic, early treatment, which is somewhat akin to abortive efforts. I initiate the treatment by the use of a one per cent. protargol solution, every four hours, two syringefuls to be kept for five minutes each, with the purpose in view of utilizing the slightly irritating properties of such a concentration to establish a serviceable discharge. In addition I apply a wet-pack around the penis—gauze strips soaked in diluted Burow's solution, with rubber tissue and roller bandages—during the day; in the evening a hot sitz-bath, or, if this is impracticable, immersion of the penis several times, for ten minutes, in water as hot as can be borne, and the wet-pack over night. I advise a nourishing diet and permit even the moderat use of beer. Besides these modifications the customary injunctions are exacted; the wearing of a suspensory; no bodily exertions; sexual rest, etc. The intelligent use of the microscope, of the greatest utility in treating gonorrhea, is absolutely indispensable here. As soon as a discharge rich in bodily elements shows up, the treatment must be changed at once. Protargol may now be employed in only ¼ per cent. strength in the customary way. The wet-pack and hot immersion are left off, beer interdicted, and the usual mode of treatment pertaining to acute gonorrhea is resorted to.

2. *As to Local Manifestations.*—Already the older writers distinguished the irritable or arterial form, the phlegmonous, and the catarrhal or lymphatic form. In the light of modern pathological views we may call these peracute, acute, and subacute gonorrhea. Clinically these forms show different degrees of inflammation. There may be present a superficial or deep gonorrheal process, one that is localized in the fossa navicularis only or extends over the whole pendulous portion or to the bulbous also, or where the deeper tissues are involved. This is due to the different degrees of virulency of the etiological factor, to the different receptivity of the tissues so affected, and to the variety of the pathological lesions caused. This deviation in manner of the three factors may be sufficient to modify the symptom complex and the different grades of severity in different individuals. It is obvious, therefore, that we cannot look forward to a remedy which would cover all these conditions, unless we can cause the invaded soil to react uniformly to the invasion, or have the gonococcus possessed with a uniform degree of virulence in all cases.

While I am a firm believer in the antiseptic treatment in the first, or purulent, stage of acute gonorrhea, I am also convinced that astringents are contraindicated in this stage. Formerly gonorrhea was held to be only a catarrhal affection of different degrees of severity, and the discharge its main symptom to be combated. Consequently astringents were exclusively employed. In the light of the modern conception, which concedes to the leucocytes the power of elimination and neutralization of the invading parasite, we look to a certain extent upon the discharge as a highly essential ally. But in the second, or muco-purulent stage of gonorrhea, when the system has done its best eliminative work, when the surviving gonococci and their toxins are lessened in numbers and attenuated in their virulency, permitting milder clinical symptoms to prevail, in the so-called subacute stage, an astringent will be useful.

Peracute Gonorrhea.—The treatment of this form should be one of extreme conservatism. Despite the promodern views of immediate interference, the old adage "nil nocere" should here be our guide. In the presence of highly inflammatory local symptoms, such as pouting of the meatus, dorsal lymphangitis, balanitis, folliculitis, cavernitis, chordee, ardor urinæ, and profuse gonococci-bearing discharge, even bland injec-

tions, let alone irrigations, are extremely painful, harmful, and fraught with danger of complications and of systemic diffusion of the process. The organism itself, which reacts so heroically to the gonococcus invasion, shows plainly that it is well fitted to cope with it. It draws on its resources plentifully. A mighty repelling battle is being fought, and instead of blood, which is not a rare intermixture, the white discharge floods the battlefield. It fairly begs in mute eloquence to be left alone! Do we inundate a highly inflamed wound with irritating antiseptics? Let no fear of entertaining antiquated ideas deter us—the railroaders of gonorrhea notwithstanding—to institute antiphlogistic and expectant treatment. Rest in bed with elevation of the penis, application of Burow's solution, or liq. plumb. subacet. c. opio, with cold water wrappings around it; a saline aperient and alkaline mixture (citrate of potash or soda in sweetened lemonade, a dram to the pint, is a pleasant, cooling extempore beverage), a bland and semiliquid diet will tide us over until the most acute symptoms have subsided, and the process enters the stage which is clinically called acute gonorrhea.

I employ a syringe large enough to moderately balloon up the anterior urethra. I deplore overdistention. To choose a syringe of different sizes for each patient, according to the capacity of the individual urethra, as recommended lately, while desirable, is impracticable and meddlesome. As the average capacity of the male urethra, that is of its anterior portion from the orifice to the compressor muscle, is about one to two drams, I think it best to use a syringe which will hold four drams. This will answer the capacity of any urethra. In injecting the contents tentatively and with great precaution and not to the point of forcing the cut-off muscle, this surplus will expand the urethra, smooth out the folds, and so will bring the remedy in contact with the whole diseased surface. The syringe should have an olive pointed tip, made either of porcelain or glass, soft or hard rubber; the barrel should be of glass with hard rubber mounting. The piston should act easily without jerking. The injection should be a prolonged one, *i.e.*, be retained in the urethra from ten to thirty minutes. The original recommendation of Neisser was that two of these injections—morning and noon—should be retained for five minutes, and the third, or evening injection, for thirty minutes. We need not adhere to these directions too slavishly; the main aim is to get the gonocidal remedy into intimate and prolonged contact with the mucous membrane. Should the fingers which hold the orifice closed become tired, the fluid may be allowed to escape and another injection be made afterwards. This may be followed by a third one, each time allowing the solution to be retained for five minutes, at least. Or the patient may inject, if there is a very profuse discharge, six times a day (the more the better), retaining it for five minutes and longer if he can. Mechanical devices for keeping the solutions in the urethra without the aid of the compressing fingers have been invented, but have proven failures.

It is impossible to make an arbitrary distinction between the different clinical phases of the florid stage. The symptoms overlap each other or coalesce. But it is quite feasible by studying the condition of the discharge to determine whether the process is in the beginning or in the acme of the florid stage. The usual time distinction by days or weeks is untenable, because an uncertain quantity.

The beginning of the florid stage is characterized clinically, besides the different subjective symptoms of pricking or smarting during urination, by a reddened somewhat puffy meatus, a muco-purulent discharge of milky or yet slightly creamy pus filling the orifice or appearing in it on pressure, but not yet exuding from it. Microscopically the greatest number of gonococci are found on or upon pavement epithelium or free, and only a smaller number in leucocytes. This shows first that the process is yet a superficial one, and second, that it has not yet extended beyond the fossa navicularis. If a patient with such clinical symptoms and microscopical evidences applies for treatment, with the second portion of the urine clear, showing no involvement of the posterior urethra or the adnexa, I begin active treatment at once. The patient having urinated, I flush the first of the pendulous urethra with warm sterilized water, using for the purpose the large 150 gm. sterilizable piston syringe with interchangeable porcelain or soft rubber tips. To avoid carrying germs into uninfected parts the patient compresses his urethra firmly, in such a way that the index and second finger of the left hand compress the urethra upwards and the thumb placed on the dorsum of the penis compresses it downward. This causes a pretty firm closure. The patient always willingly assists, as there is a dim tradition extant which undeservedly fell into oblivion of late, that compression of the deep urethra during injection prevents gonorrhea from spreading backwards. The cleansing done, injections of protargol in one-fourth per cent. strength are resorted to; two syringefuls every two hours during the day and twice during the night and each retained from five to ten minutes, yields excellent results. This is the condition in which early heroic treatment secures results almost bordering on abortion of the disease. By some this is claimed to be an abortive cure, and is so utilized in their statistics.

As conditions exist, however, patients will come for treatment when the acme of the florid stage is reached, and purulent, thick, whitish-green pus appears with increased inflammatory symptoms. This usually happens in the second week, and in patients with first infection. If in the judgment of the physician the inflammatory symptoms are not of a peracute character, then an immediate injection, two syringefuls, each retained for five minutes, every three hours, will act with great precision. A somewhat increased discharge will be observed during the first few days, showing al-

most nothing but abundant gonococci-bearing pus cells, epithelium being present only in a scanty quantity. In this form with sufficient leucocytosis and with moderately acute inflammation, interference is justified. In a few days, mostly at the end of the second or middle of the third week, the scene changes; the symptoms indicating a retrogressive inflammation are noticeable, the discharge becomes thinner and mucopurulent and then serous, diminishing in amount, the clinical symptoms gradually becoming milder, resembling the initial stage. Microscopically we will find at this time a diminution of the number of gonococci-bearing pus cells. Transition epithelium with gonococci covering it in clumps appears more frequently in the proportion as the process assumes a subacute aspect or tends toward recovery. As soon as these signs appear we must attend to the secondary lesions caused by the gonococci. These are erosions and fissures. It is in this stage that an astringent is absolutely necessary. Finger recommends in this stage either argentamine or nitrate of silver, but I think that they yet prove to be too irritating.

Subacute Gonorrhea.—This is a gonococcus infection of a milder character. As mentioned elsewhere this form is due either to an attenuated virulency of the gonococcus or to a lessening receptivity of the urethral mucosa. Both factors—the invading and repelling power—being of equal strength a deeper penetration of the gonococcus will not take place. What the process lacks in deep diffusion, however, is equalized by its extension to the adjacent parts. The symptoms being of a milder character they are easily overlooked by the patient and a surface extension may eventually take place by involvement of the posterior urethra and prostate. We consider here only that form of subacute gonorrhea which starts *ab origine* as such, with slow intensity and lenient in form, mostly in individuals that have had one or several attacks, or in those debilitated by some constitutional disorder. I am somewhat suspicious of this form when occurring as a first infection in a robust and healthy individual. Its insidious course invites negligency of attendance from the patient, and probably a somewhat undecided treatment on the part of the physician. I have frequently seen the bulbous part become affected and chronic posterior gonorrhea to develop. If in these cases the discharge contains the above described negative microscopical evidences I recommend active treatment to be initiated at once. If the gonococci-bearing leucocytes are present in a desirable quantity then the treatment should be less active. A medium degree of drug irritation in a sluggish case is apt to bear better results than a vacillating treatment. I do not mean that a mild process must necessarily be turned into a grave one. It is necessary only to give a slight impetus to the deviated natural process, like, for example, the application of the silver nitrate stick to sluggish granulations.

The treatment of this subacute form where the gonococci are located superficially should be pursued with the idea of removing them mechanically as well as remedially. That mechanical antisepsis with chemical agents proves of more value than indifferent solutions was emphasized by Kiss,[89] and also by Joos[90] and Woodruff,[91] who have used hot water, boric acid solutions and decinormal salt solutions with good effect. I regard them only as adjuncts to the antiseptic injections. A one-quarter per cent. protargol solution, one syringeful three times a day, will suffice to cause sufficiently active discharge by increased leucocytosis. While some may look upon this procedure as a somewhat unusual step I regard it necessary for the future welfare of the patient. Want of active inflammation causes persistency of the gonococcus. This is also evidenced by the stoppage of the discharge when epididymitis or inguinal adenitis complicates gonorrhea. It seems that the active inflammation in these parts causes a relative anemia in the urethra with diminished or even arrested emigration of leucocytes and undisturbed persistence of the gonococci in the subepithelial tissues. While I do not coincide with Schlossberg[92] that these complications are a cure—hastening corrective, yet it seems to me to strengthen my contention on the eliminative value of active congestion. Quite recently I have occasion to extirpate a packet of deep inguinal glands complicating a subacute form of gonorrhea. During the time that efforts were made to cause absorption by conservative means the discharge dwindled down to a small mucous drop with hardly any gonococci, appearing only on stripping the urethra. Twenty-four hours after operation a free discharge laden with gonococci reappeared, and the active urethritis was treated and cured without further complications.

The further treatment of all these forms of acute gonorrhea conform to the *microscopical* evidences. As soon as the leucocytes do not predominate any more and a liberal admixture of columnar or pavement epithelium supervenes with gonococci upon them and also free, we have arrived at the stage of decrease or terminal subacute stage. I then resort to astringents, using a one-half per cent. solution of zinc sulphate, alternating with the antiseptic four times a day, each being used every four hours. In the proportion as the gonococci and pus corpuscles diminish and give room to transition and pavement epithelium cells in the discharge the antiseptic injection is used in the morning and at bedtime, while the astringent is injected twice during the day. Soon the discharge will be reduced to a scanty morning drop, and then we have to turn our attention to the character of the shreds. So long as they contain gonococci and pus cells the alternate use of antiseptic and astringent injections must be continued. It will happen sometimes that gonococci are not present in the shreds while pus corpuscles are abundant. This calls for the alternate treatment yet, as the presence of leucocytes is always indicative of gonococci and secondary lesions. But if gonococci are absent and pus cells present

only in small numbers, diligent microscopical examination showing their gradual disappearance, while abundant epithelium indicates the final process of desquamation, then irrigation with the large hand syringe of silver nitrate solution of from 1 to 4,000 up to 2,000, without catheter, every other day, will prove highly curative to the secondary lesions. If the discharge shows up again I have found permanganate of potash in this stage, 1:6,000 to 4,000 extremely useful in allaying the effects of a previous overstimulating treatment. It may happen that through indiscretion or otherwise a subacute exacerbation may cause gonococci to reappear. Washings of the anterior urethra with a mild protargol solution (one-quarter per cent.), using the large syringe, will then be in order, while the patient uses an astringent at home. If the exacerbation yields a discharge containing streptococci and staphylococci and other bacterial contamination besides mucus, fibrin, and epithelia, characterizing the so-called secondary infection or bacillary non-gonorrhoic uretritis, mentioned elsewhere in this paper, then flushing with bichloride solution 1: 20,000 to 10,000, must be employed. A viscid grayish scanty discharge in the meatus, which under the microscope shows only mucus and epithelium embedded in a network of fibrin, an occasional pus corpuscle and chains of cocci, is either a simple postgonorrhoic terminal catarrh or due to overtreatment. Gradual cessation of treatment and rest will soon cause its disappearance.

Cure.—This ends the injection treatment. The patient is now directed to report once a week. The usual mode of life is resumed gradually. If no discharge shows up within two weeks he is permitted to partake of alcoholics. The beer tests or a provocative injections of nitrate of silver, 1:1,000, are now tried either singly or together. Discharge following should be examined not earlier than twenty-four hours after its appearance, the urine to be centrifugated and the deposit examined. If after repeated examinations there are no gonococci present the patient may be regarded as cured. But I am in the habit of examining the patient once a month for three months. If no discharge is obtainable and if the shreds are negative I obtain some secretion for microscopical examination by expressing the prostate and seminal vesicles. In uncomplicated cases the Thompson two-glass test will prove sufficient. If posterior involvement is present the Jadassohn-Goldenberg three-glass test or Kollmann's five-glass test should be employed. These steps, however, serve to determine the seat of chronic gonorrhea, which is not within the province of this paper. I have dwelt on these points elsewhere.[93]

The complications of gonorrhea demand immediate cessation of active treatment. Edema, lymphangitis, chordee, ardor urinæ, cavernitis have been dwelt on under peracute gonorrhea. When acute posterior gonorrhoic urethritis, or urethrocystitis, or involvement of the prostate and epididymitis, etc., appear as much dreaded complications I adhere to the same principles that govern me in the treatment of the different enunciations of acute anterior urethritis. In the face of promodern theoretical reasoning to pursue active treatment, I feel satisfied that by employing rest, antiphlogistic and symptomatic treatment until the storm is over, I have done more for the comfort and safety of the sufferer than by pursuing to the bitter end the results of laboratory investigations. The stranguric patient's urethra is not a simple culture medium, in which the gonococci must be killed at all hazards. This test tube has sensitive nerves. The peracute symptoms over, active treatment can be gradually resorted to.

It is very difficult to enumerate all possible enunciations of acute anterior gonorrheal urethritis. In the foregoing some of the more common ones were merely alluded to. It is a sound principle to conform our treatment to the condition of the mucosa borne out by the microscopical evidences. The microscope is an absolute necessity for the intelligent treatment of gonorrhea. The methods of staining specimens—a useful, interesting and a not too difficult exercise—should be mastered by every practitioner treating gonorrhea. He will be amply rewarded by the results. That gonorrhea is a serious affection, especially in its later manifestations, must be impressed upon the patient as well as upon those of our ranks, who yet look upon it complacently as "only a little clap."

The treatment and handling of the affected parts should be done in a clean and aseptic manner. Both physicians and patient should beware of infecting their eyes. Ablution of the parts with a 4 per cent. boric acid solution should precede treatment. The hand syringe used by the patient should be kept in a clean piece of sterilized gauze. Before using it should be squirted through with hot water.

Realizing that there is still a considerable difference of opinion in reference to the treatment of gonorrheal urethritis, it occurred to me that it might prove both interesting and instructive to institute an inquiry which might afford some positive deductions in this vast field of negations. A list of questions was sent to 240 genito-urinary surgeons throughout the United States, of whom 127 responded, and I take this opportunity to extend to them my cordial thanks. Of these 29 failed to give any definite information for various reasons, and their answers cannot therefore be utilized. As my correspondents include many of the leading genito-urinary specialists in this country the results of this inquiry may be regarded as an authoritative expression of the present views on the treatment of gonorrheal urethritis.

To the question, "Is the destruction of the gonococcus the chief aim of your treatment?" 75 per cent. responded in the affirmative.

In reference to the inquiry, "Have you found the abortive treatment of value?" the views expressed are about equally divided, and this was also the case with the question, "Is it your cus-

tom to begin with local treatment in the most acute stage of the disease when highly inflammatory symptoms are present?"

The inquiry, "Which mode of treatment do you prefer, irrespective of the drug used: (the Janet method of hydrostatic irrigation; flushing with the large piston syringe, or injection with the full-sized hand syringe?) elicited no definite answers, since some correspondents had no choice.

In answer to the question, "Which among the new silver preparations has given the best results in your practice?" 50 per cent. expressed a preference for protargol, 50 per cent. preferred other silver salts (argonin, argyrol, argentamine, albargin, and sublamine).

It seemed interesting to determine whether complications are less frequent when the new silver salts are used, and in response to my inquiry on this point nearly 75 per cent. expressed themselves in the affirmative.

The inquiry, "What percentage of gonorrheas so treated by you becomes chronic?" gave rise to a wide difference of opinion. While about 20 per cent. of my correspondents stated that under their special treatment the disease rarely, if ever, assumed a chronic type; about 30 per cent. were doubtful, and the remaining answers ranged from 1 to 50 per cent. of cases.

Although I am aware that from such a limited number of data covering different conditions and drugs no definite conclusions can be deduced, yet it gives a partial outline of the prevailing ideas on this mooted question.

The majority of the correspondents seem to be imbued with the idea of the extreme chronicity of gonorrhea. The same majority are convinced also that some treatment should be instituted. It is this vast proportion of medical men that advocate mostly treatment on conservative lines. It is surprising that the abortive treatment, according to the returns, has such a large number of adherents. This, in my opinion, is due to the use of the new silver salts, as their lack of irritation in comparison with nitrate of silver makes their employment less painful and risky. As a large number commence treatment when highly inflammatory symptoms are present, this would seem also due to the new silver salts and their mildness of action. There is a wide difference of opinion. They have narrowed down considerably, the choice of the remedies answering the definite indications based on the biology of the gonococcus.

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THE DIAGNOSIS OF INCIPIENT PULMONARY TUBERCULOSIS.

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So much has already been aptly said and well written upon the diagnosis of incipient pulmonary tuberculosis, that I can hardly hope to bring forward any new or original thoughts on the subject. I shall try, however, to emphasize some facts which have been indubitably proven, but which are at present inadequately recognized.

Unfortunately the onset of tuberculosis is accompanied by such slight symptoms, that when the patient presents himself for treatment, several months have usually elapsed since the implantation of the tubercle bacillus first occurred; but a recognition of the disease even at this time is as a rule sufficiently early to justify the expectation of a cure.

The most common symptoms of pulmonary tuberculosis are, loss of bodily weight and strength, with failure of appetite and a tendency to become easily fatigued,—a symptom-complex which is generally summed up by the expression "run down." It is a safe axiom to assume that every hemoptysis is tuberculosis in origin until proved otherwise; and a similar rule may be laid down for an attack of bronchitis, which, without evident cause, lasts for more than six or seven weeks. A mode of onset which is fairly common, but by no means generally recognized, is that of pain and stiffness of the joints. In these cases the lungs are often not examined, and the patient is treated with various antirheumatic remedies without benefit. Observation is teaching us that quite frequently chronic arthritis is of tuberculous origin; and certainly arthralgic pains and peripheral neuritis are very common in tuberculosis of the lungs, as are also slight pain in the shoulders and back, and vague sense of oppression or discomfort in the thorax.

Distinct pain in the chest, due to a pleuritis, is usually not an especially early manifestation; neither are chills, fever or night sweats, at least not when these reach sufficient proportions to be complained of by the patient. Slight fever, however, of which the patient is unconscious, especially if recurring regularly towards evening or after exertion, is very suggestive. This pyrexia is, as a rule, very slight in amount, being perhaps only one-half or one degree above the normal, on which account it is often disregarded. Night sweats, too, are often trivial; they may be confined to the axillæ, and be attributed to an abundance of bed-clothes. Vasomotor paresis and cardiac erythism are frequently encountered; the former manifesting itself by transient erythema and sudation; the latter by tachycardia, which is still more increased by slight exertion or mental excitement; this acceleration of the pulse accompanied by dyspnea on exertion is very characteristic.

Prolonged or frequent hoarseness should always be carefully investigated, as should also dyspepsia, prolonged diarrhea or other gastro-intestinal symptoms. Cessation of the menses in women does not usually occur until the disease is considerably advanced. It should always be borne in mind that pulmonary tuberculosis—especially when the infection is a simple one—may not only exist, but even be well advanced, without the patient having been conscious of cough. All attacks of pleurisy should be treated as "suspects." A large proportion of these cases subsequently develop tuberculosis of the lungs, and have a similar origin. If effusion is present the aspirated fluid may be shown to contain tubercle bacilli, this being most accurately demonstrable by animal inoculation.

Careful questioning in regard to the patient's personal and family history will often beget information of the most useful character. In about two-thirds of the cases the source of infection can thus be learned and valuable data obtained as to the amount of time which has elapsed since the primary implantation took place; from which deductions may be drawn regarding the course which the disease has and probably will run. A second attack of supposed typhoid fever, or an unusually protracted siege of influenza, will often indicate the time when the tubercle bacillus first became pathologically virulent.

Attention has often been called to the habitus phthisicus—a flattened, elongated chest, with prominent clavicles and scapulæ, glistening bluish-white scleræ, dry, fine, brittle, lusterless hair; sunken or hectic cheeks; sharp nose; mydriasis; a red line on the gums, and other well-known signs. Any or all of these may be present, although usually not in early cases, and may be of help in making a diagnosis, but their absence should never throw us off our guard. Distinct tubercular lesions are often found in apparently well-nourished and robust individuals. The presence of slight spinal curvature, or of scars on the neck, the result of a lymphadenitis in early life, are much more important findings. Physiological sufficiency of the thorax is more to be looked for than mere anatomical configuration.

Physical Signs—At the very outset I should like to emphasize the necessity, in every case, of an entire and absolute exposure of the chest when making a physical examination. It is often stated that the majority of heart lesions may be correctly diagnosticated by inspection and palpation; but in no phase of internal diagnosis can more be learned from inspection alone than in pulmonary tuberculosis. Two reasons why this disease is so frequently overlooked is, that the lungs are examined through the clothing, and that the stethoscope is not employed. The latter is no less essential than the former, not only for careful localization, but in order to auscult certain regions at all; notably the supraclavicular fossæ, and the axillary apices, two of the most important regions.

Inspection of the chest should be made under good illumination, and care should be taken to

have the shoulders lowered and the muscles of the shoulder girdle relaxed. By standing alternately a little distance in front of the patient, and again by looking over the shoulders from behind, changes in the respiratory movements can be readily detected. On the affected side diminished or delayed expansion will be found, perhaps also restricted diaphragmatic excursion, the latter being due either to pain or to adhesions of the pleura. Supraclavicular and infraclavicular depression, or subclavicular flattening will often indicate the location of the lesion. Inequality of thoracic expansion can be very readily determined by means of a tape measure in which the ascending scale of inches is laid off in each direction from the middle. Distinctly restricted movement on one side of the chest without evident skeletal deformity should make us very strongly suspect tuberculosis.

Palpation is perhaps the least valuable of the four routine methods of investigation; doubtless because a thickened pleura vitiates the physical signs as evinced by fremitus. As a rule, however, corroborating evidence to that obtained by inspection will be produced, especially in regard to the amount and relative extent of the expansion.

Percussion usually elicits a change of resonance, which may range from slight impairment to absolute flatness; the note depending largely on the character, extent and depth of the pulmonary involvement, as well as upon the amount of pleural thickening or compensatory emphysema present. The apices of the lungs above the clavicles being near the surface should always be lightly percussed. Deep-seated lung involvement requires forcible percussion to elicit changes in resonance. The use of the fingers alone in percussing is to be preferred to artificial pleximeters, owing to the very valuable sense of resistance which is thus retained; at times, however, slight changes in pitch can be more easily detected by the use of an ivory instrument.

A careful comparison of corresponding areas should always be made, bearing in mind that under normal conditions the resonance is usually more marked in the right chest. If percussing the anterior surface, the patient's arm should hang relaxed at the sides; if posteriorly, the hands should be placed on the opposite deltoids; if in the axillary line, they should rest upon the head, the elbows being thrown slightly backward. As far as possible muscular relaxation should be attained, and the patient's head be held in the same planes as the body.

Percussion over a tuberculous area frequently produces pain, especially if there is marked pleural involvement; when performed over a cavity it is often productive of cough and expectoration; the latter phenomenon when occurring is, I think, very suggestive of a vomica. If the lesion is deep-seated and compensatory emphysema exists, hyperresonance may replace impairment. Abrams especially insists that tympany and not dulness is the note most often encountered in early tuberculosis.

In the acute differentiation of the percussion resonance the personal equation enters largely into account. An ear which readily analyzes musical notes will always be more expert in pulmonary diagnosis, other things being equal; but in every case special education and practice are necessary. It is not enough to be able to distinguish changes in sound; we must also be able to recognize the amount of their deviation from the normal, and to interpret their pathological import, if such they have. It is a safe plan to begin percussing over a part of the lung which we know to be healthy, and gradually approach the part which we know to be diseased. In this way we refresh the memory as to what true resonance is, or at least measure the extent to which it exists in the individual in question.

Auscultation reveals the most important information. Before resorting to it, however, it is well to spend some time in instructing the patient to breathe properly, "a little deeper than naturally," and seeing to it that he does so, before listening to the chest. This procedure is very time-saving in the end and eliminates many possible sources of error. If the patient's neck is craned forward or backward, and in some cases even in a straight position, rancous, throaty sounds will be transmitted to the chest, which may closely simulate bronchial breathing, and be the cause of much confusion. Stenosis of the trachea or pressure upon the bronchi from aneurism, tumor or enlarged bronchial glands, may produce a similar result. These cases are differentiable from tuberculosis through the equal bilateral quality of the sounds produced, and by the absence changes in resonance. Expiration should be passive, no voluntary expiratory effort being made. Patients suffering from any nasal obstruction should breathe through the oral cavity.

The entire chest must, of course, be carefully ausculted, but special attention should be paid to the apices above and below the clavicle, anteriorly; the supraspinous fossæ and the areas which underlie the inferior extremities of the scapulæ, posteriorly. The latter areas correspond to the fissure between the upper and lower lobes. If râles are absent, the patient should be made to cough forcibly and take deeper inspirations; a procedure which will often cause doubtful findings to become clear pathological manifestations. In the early stages of pulmonary tuberculosis glaring physical signs must not be expected. Expiration may be but slightly prolonged, or perhaps only roughened; in some instances an unduly suppressed and indistinct respiratory murmur is equally indicative of disease. Bronchial breathing does not occur until marked infiltration has taken place. Fine, hair-like crepitant râles, heard especially at the end of inspiration, localized to a certain area, though not necessarily the apex, are very characteristic of tuberculosis; but often much coarser râles may take their place or be commingled with them.

There is much truth in the hackneyed adage that a "unilateral catarrh is not a catarrh." Due,

but not too much, allowance must always be made for the bronchovesicular respiration which is normally encountered, especially in women, posteriorly over the bronchi; and anteriorly at the second right costosternal articulation. Tuberculous foci in the latter location have to be determined by the percussion changes, the pressure of râles, the date obtained by inspection, etc. The normal breath sounds at the right apex, similarly to the resonance, are more intense than on the opposite side. Pleural friction sounds are not infrequently heard over infected areas, coincidently with râles; they are usually low in pitch, rough, grating in character, unchanged by coughing, intensified by deep breathing, and remain localized for extended periods of time. Such frictions may be simulated by the sounds which the scapulæ sometimes produce in rubbing over the dorsal fascia; the latter, however, can be made to disappear by changing the position of the shoulder-blades.

As has been already stated, great care should be exercised to secure complete relaxation of the thoracic and dorsal muscles, because the sounds produced by contracting muscle fibers may considerably modify the character of the respiratory murmur, and a patient who is straining or even exerting his voluntary muscles will not breathe in a soft, natural and effortless manner.

But little attention should be paid to cog-wheel respiration. This phenomenon may occur from irregular contraction of the respiratory muscles, and is very common in excited or neurotic patients. It is noted in many non-tuberculous cases, especially anteriorly near the heart, and in lung areas overlying the large vessels. Subclavian murmurs are frequently observed; they usually appear or become intensified toward the end of a deep inspiration, and are apparently due to constriction of the vessels by consolidated lung tissue or adhesions. When heard they are perhaps suggestive, but by no means pathognomonic, of tuberculosis. Accentuation of the pulmonary second sound is a very constant finding, even in early cases. Cardiac murmurs are by no means rare; they may be due to anemia, relative insufficiency of the valves or otherwise abnormal heart action. Distinct organic valvular lesion, while by no means excluding tuberculosis, as formerly supposed, are not very frequent complications. Cardiac-respiratory murmurs are often met with; they possess neither diagnostic nor clinical significance.

The detection of tubercle bacilli in the sputum is satisfactory evidence as to the etiology of the condition; their absence, however, is no disproof of it. The sputum of advanced cases, with well-marked evidences of cavity-formation, often has to be examined a number of times before tubercle bacilli can be demonstrated; and in incipient cases often 20 or 30 examinations are required before a positive result can be obtained. Truly incipient cases have, as a rule, no expectoration whatsoever, the cough itself being often unnoticed by the patient. The present tendency to defer the diagnosis of tuberculosis until bacilli have been found in the expectoration is most unfortunate for the patient, and often humiliating to the physician. No hesitancy exists in telling a patient suffering from cardiac or renal lesions of their true condition, and insisting upon hygienic reformation; but the tuberculous individual, who harbors a far more curable disease than either of these, is allowed to remain in a benighted state regarding his malady until a physical breakdown brings to his own realization the fact that he is afflicted with more than a transient disease. The symptoms, clinical history and physical signs are in many cases sufficient to justify a diagnosis of pulmonary tuberculosis without an examination of the sputum at all; and until this fact is more generally recognized, the future, like the past, will witness the transport of a remediable incipiency to a hopeless advancement before the diagnosis is pronounced.

The demonstration of tubercle bacilli in the sputum may be considerably abetted by centrifugalization, or by the more recently introduced method of inoscopy—which consists of liquefaction of the sputum by a process of digestion before centrifugalization. Animal inoculation when feasible is also of assistance, but requires time and especial facilities. In the light of modern belief the infrequency of tubercle bacilli in early cases is easily explained. Nearly all investigation is tending to prove that this micro-organism is never inhaled directly into the air vesicles, and that pulmonary infection when present has always been preceded by an infection of the bronchial lymphatic glands; the portal of entry having been the bronchial or intestinal mucous membrane, the tonsils, etc. This being the case, the bacilli have literally to come through the lungs before they appear in the expectoration, a process which does not occur until necrosis of the pulmonary tissue has taken place. Large numbers of bacilli, unless continuously found, are not necessarily an indication that the disease is far advanced. They may be due to the breaking down of a small nodule, which happened to occur at the time when the sputum was collected for examination.

The tuberculin reaction is a useful adjuvant in diagnosis, to be held in reserve. While not infallible as a positive test, its absence precludes the presence of tuberculosis. The value of serum diagnosis is still sub judice. The X-ray, laryngeal mirror, and occasionally the ophthalmoscope, have been of distinct value in diagnosis, but unfortunately expert testimony is required to make the evidence thus obtained of material weight.

Differential Diagnosis.—The conditions which most closely simulate incipient pulmonary tuberculosis are syphilis, influenza, and mitral disease, especially slight grades of stenosis, healed tuberculous lesions and simple streptococcic infections of the lung, and non-tuberculous fibrosis. Much diversity of opinion exists as to the frequency with which syphilis affects the pulmonary tissue, but prevalent belief is to the effect that this is more commonly the case than is generally sup-

posed. Aside from a history of such infection, localized evidences, such as cutaneous scars or other tertiary lesions may be present. Syphilis usually begins at the hilum of the lung. It may spread upward, but more usually affects the lower lobes. Tuberculosis begins just below the apex, and generally affects the adjacent lobe before spreading to the opposite side. In syphilis there is, as a rule, equal bilateral consolidation, often without râles; emaciation, expectoration and fever are less marked, hemoptysis is more rare. The patient seems much less ill than would be the case from an equal amount of tuberculous pulmonary involvement. The tuberculin test is of no value in these cases because syphilitic patients sometimes give a positive reaction. A laryngeal examination may be decisive if this organ is involved; but generally the diagnosis hinges upon the sputum examination and the therapeutic test—tuberculous patients being nearly always made worse by the administration of mercurials and iodide of potassium.

Influenza and pulmonary tuberculosis are more frequently confused; but here the protracted course of the latter, the presence of a slight regular evening rise of temperature, night sweats, hemoptysis, progressive emaciation, accentuation of the pulmonary second sound, localization of the physical signs and tubercle bacilli in the sputum are features of differentiation. As has already been stated, many cases of supposed influenza are acute exacerbations of pulmonary tuberculosis. The mere recurrence of such attacks, especially if subsequently the health of the individual remains impaired, should make us very suspicious of tuberculosis. If a diffuse bronchitis co-exists it is often necessary to defer a positive diagnosis until the latter has cleared up.

Slight traces of mitral stenosis may render the diagnosis for a considerable time uncertain. In either condition we may have a rapid pulse, cough, expectoration, râles, easily provoked dyspnea and fatigue, gastric symptoms, accentuation of the pulmonary second sound, hemoptysis, etc. But here again cyanosis, with marked right-sided cardiac enlargement, diffuse unilateral involvement of the lungs, most marked at the bases, without pyrexia, as well as the absence of night sweats, are evidence in favor of a heart lesion. The blood pressure in mitral stenosis is apt to be slightly above the normal, while in tuberculosis arterial hypotension frequently exists. Precordial thrills are commonly encountered in the last-named disease, owing to general emaciation or to retraction of the lung; but when unaccompanied by mitral stenosis they are not presystolic in time.

Healed tuberculous lesions, if complicated by an acute infection such as bronchitis, require more or less prolonged observation, frequent examinations, and careful consideration of the anamnesis, subjective symptoms and general health.

Non-tuberculous fibrosis is to be recognized by its equal bilateral character, absence of fever, hemoptysis, tachycardia, night sweats, etc., but especially by the disproportion between the amount of lung tissue involved and the apparent illness of the patient, as well as by the absence of tubercle bacilli.

Some of the most puzzling cases are those which occur in old people, in whom the respiratory sounds are suppressed, or in those who are known to have emphysema, with perhaps cardiac and renal degeneration as well; in which the question arises as to the additional presence of an active or a healed tuberculous lesion. Such cases necessitate repeated physical examinations and the employment of all available diagnostic means. Fortunately, the diagnosis in these instances is of less moment than when occurring in patients of an earlier age; inasmuch as the tuberculous process is apt to run a slow and protracted course, so that under reasonable hygienic conditions the length of life is not naturally shortened thereby.

Simple localized lobular streptococcus infections of the lung, such as have been described by Finkler and A. Wassermann,[1] may so closely simulate tuberculosis as to be differentiable only by the continued absence of the tubercle bacillus from the sputum and a negative tuberculin reaction. Such cases, compared to the prevalency of tuberculosis, do not occur with sufficient frequency to make their similarity of much clinical importance.

It is always well to defer a positive diagnosis in cases of complicated pleural effusion, bronchitis or any other acute infection. A certain number of cases are encountered which for a time baffle even the most expert diagnostician. But repeated and careful examinations will usually solve the perplexity. The diagnosis of incipient primary tuberculosis should be within the power of every physician. The vast majority of cases require neither special facilities nor unusual abilities for their detection. It is largely a question of care and common sense, together with a reasonable degree of efficiency in medical knowledge and physical diagnosis.

It is a deplorable fact that many practitioners to-day are either unable or unwilling to diagnosticate pulmonary tuberculosis in its early stages. This is in part due to the general skepticism which exists to a greater or less extent in regard to the curability of the disease. To some members of the profession the fact that the patient makes a satisfactory recovery at home in the course of a few months is a proof that the disease was not pulmonary tuberculosis; notwithstanding the fact that nearly every human being has harbored some tubercle bacilli in his system at some stage of his career, and that autopsy statistics reveal distinct tuberculous lesions in nearly one-half of all cases dying from other diseases. The frequency with which supposedly incipient cases of tuberculosis are sent to the examiners of the White Haven Sanatorium, who upon examination are found to have two, three, or even more lobes of the lung distinctly involved, is almost beyond belief. Non-

[1] Fränkel. Spezielle Pathologie und Therapie der Lungenkrankheiten, 1904.

tuberculous cases are not often diagnosticated as tuberculosis; but the reverse, unfortunately for the patient, is a common occurrence. It is time for the medical profession at large to realize more fully that attacks of chronic bronchitis, bronchopneumonia, influenza, typhoid fever, etc., less frequently "go into consumption" than that they are manifestations of tuberculosis from the onset. "It is probable that if the physician resisted his life-long habit of optimism and erred in the opposite direction in cases of suspected tuberculosis, the mortality list would be shorn of a measurable proportion of its bulk."—(Butler.)

The crusade against tuberculosis, which is having an awakening in this country, cannot be efficiently carried out by a few specialists alone. Neither will the multiplication of sanatoria throughout the land be of benefit to the population as a whole, or bear such fruits as will justify their erection, until the medical profession at large is able to recognize pulmonary tuberculosis in its incipiency, and is willing to send patients to these sanatoria who are still in a curable stage.

DIAGNOSIS OF ADVANCED TUBERCULOSIS.

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IN taking up a subject which presents so many varied forms it becomes necessary to group the different types together in some systematic way in order to bring it within the limits of the present paper. The classifications according to distinct clinical types or depending on distinct pathologic conditions are too elaborate, except for a detailed study, the cases running one into another so closely and changing so constantly. The classification of Turban has been selected for the reason that, although somewhat crude and restricted, it possesses the advantage of simplicity, and further takes into account not only the local conditions, but also the constitutional effects of the disease.

Turban divides the cases into three classes: *Class I.* Mild cases, infiltration of at most one lobe, or two half lobes. *Class II.* Mild cases, infiltration of at most two lobes; or severe cases, infiltration of at most one lobe. *Class III.* All cases not included in Classes I and II. This paper will only consider Classes II and III, considering them together.

The diagnosis of tuberculosis has passed through various phases or epochs, determined by different important discoveries which had marked influence upon the methods of that period. Perhaps the first great step in more recent times was brought about by the work of Laennec, which started the era of diagnosis by "physical signs," at which time the diagnosis was based entirely upon the examination of the patient, with a tendency to disregard the history of the case and the symptoms. Later, under the stimulation of Koch's great discovery, it suddenly passed into the era of "bacteriologic diagnosis," at which time the enthusiastic supporters of this method disregarded physical signs and depended entirely upon the finding of tubercle bacilli in the sputum for their diagnosis. The influence of this idea has not been entirely overcome in the present day. With improvement in the method of treatment, which emphasized the importance of early diagnosis, every effort was bent upon discovering some absolute means of early diagnosis other than those in use. Thus the era of "early diagnosis" is characterized by various methods of diagnosis, each with its group of adherents all more or less enthusiastic. Even the most devoted followers of the Roentgen rays, tuberculin reaction, examination of the cellular elements of the blood, blood-serum agglutination tests, study of the temperature after exercise, and chemical examination of the urine as a means of diagnosis, emphasize the importance of merely considering them in conjunction with a thorough study of the case itself.

The age, sex, habits, social condition and general history have, of course, the same bearing in an advanced as in an early case, and I will only mention one or two points which have special significance in the former. The exact, or as nearly exact as possible, determination of the duration of the disease is important in its relation to the amount of involvement, when considering the nature of the condition present. This is true also of the general surroundings and mode of life of the patient. For example, a patient who has only slight involvement of long duration under unfavorable circumstances is distinctly different from a patient with extensive involvement of short duration under favorable circumstances. This point belongs perhaps more to a consideration of the prognosis and treatment, but a diagnosis is of little practical value unless it includes not only the presence of, but also the character of, the involvement.

In describing the symptoms I have tried to give, wherever possible, the proportion of cases of tuberculosis in which the different phenomena occur. The figures are taken from the statistical reports of Roepke and Turban, for the reason that these two authors use the same classification, to which I have already referred.

The symptoms to be considered are cough, loss of weight, hemorrhage, night sweats, chest-pains, dyspnea and cardiac palpitation.

Cough.—This is perhaps the most frequent symptom in advanced cases of tuberculosis, it being extremely rare for cases to proceed to this stage without more or less marked cough. That cases may rarely go on to even cavity formation without severe cough should never be lost sight of. It is in no way characteristic, varying in time, character and degree. The expectoration also varies greatly, both in quantity and appearance, from the thick, tenacious, nummular sputum to fetid purulent material. The morning cough with expectoration, due to the retention of secretion over night, may first attract the patient's attention to the presence of cough, but is not distinctive. Both authors quoted give this symptom as occurring in 100 per cent. of cases in this stage.

Loss of Weight is as common a feature as the foregoing symptom. It varies from merely slight loss, which it may require very careful questioning to bring out, to marked emaciation. It is generally progressive with occasional slight remissions under favorable circumstances. This was also present in 100 per cent. of cases.

Hemorrhage.—When it can be definitely determined that the hemorrhage is from the lung itself, this is a most valuable sign. It may not infrequently be the first symptom to call the patient's or the physician's attention to the lungs. The nature of the hemorrhage in regard to its cessation, whether spontaneous, following violent effort or trauma, is important. The statistics quoted by Osler in regard to hemoptysis in general give interesting figures. Of apparently spontaneous hemoptysis about 86 per cent. are due to tuberculosis, of those following exercise about 74 per cent. are due to the same cause, and of those following trauma 50 per cent. are not due to tuberculosis. On the other hand, 70 per cent. of Roepke's cases had hemoptysis and 61 per cent. of Turban's. Mitral stenosis as a cause of hemoptysis is not uncommon and should always be excluded.

Night Sweats.—Although not quite so frequent as the former symptom, they are not uncommon, occurring in 55 per cent. of Turban's cases. They may occasionally be very severe in character and form a most distressing symptom. They occur most frequently in the early morning hours.

Chest-pains.—These may occur between the shoulder blades, in the shoulders, or in the sides of the chest, the two first mentioned occurring more frequently in the early cases. The pains in the chest itself are much more common in the advanced cases, due either to an extension of the tuberculous process to the pleura or to some associated inflammatory process.

Dyspnea and cardiac palpitation, although in no way distinctive, are not uncommon symptoms. The former frequently may cause the patient great distress, and does not seem to bear any constant relation to the amount of lung tissue involved.

Fever.—This is not a constant feature, but the cases are extremely rare that do not show some elevation of temperature at some time during the twenty-four hours. This elevation may be slight and detected only by careful methods in using the thermometer, and frequently goes undetected when these precautions are neglected. I refer to insisting upon the patient keeping the thermometer well under the tongue, the lips kept tightly shut, not taking the temperature directly after the patient has taken anything hot or cold, and being careful to leave the thermometer in the mouth from six to ten minutes. The type of fever varies greatly, not only in different cases, but in the same patient at different times. An afternoon or evening rise with morning remissions or intermissions is by far the most common. This rise may be very high at times, with marked intermissions, and shows, as a rule, decided irregularities. Some writers lay great stress also upon a premenstrual rise in the temperature in tuberculous female patients, and others upon a rise in temperature following exercise.

Pulse.—A rapid pulse is the rule, not always proportionate to the degree of fever or even the amount of involvement. Cases which show very slight rise in temperature, showing frequently a pulse of 100, 120, or even 130. The character of the pulse is not typical, although a full but soft and compressible pulse is commonly noted.

Physical Examination.—In the examination of the patient we have the most important method of diagnosis. The signs elicited vary greatly in character and require not only careful but repeated examinations to determine their significance.

Inspection.—By this means one notes the general appearance of the patient, character of skin and mucous membranes, amount of subcutaneous fat and general muscular development. More important, however, are the configuration of the chest and expansion of same during respiration, noting the rate, excursion and a comparison of the two sides. There has been so much stress laid upon the long, narrow, phthisinoid chest, with its vertical ribs, narrow costal angle, and projecting scapulæ that I merely mention it in passing. It is met with quite frequently; Roepke shows 26 per cent. Another type of chest is that with a narrow anteroposterior diameter. Any form of chest, however, may be the seat of tuberculosis. Localized retraction or tardy expansion of either one or both apices, especially depression above or below clavicles, are also valuable when present, and when sought for carefully will be found not infrequently.

Palpation is mainly useful in confirming inspection, especially in detecting diminished expansion, and in estimating vocal fremitus, the latter being increased over consolidation or cavity, and diminished over collections of fluid or thickened pleura.

Percussion.—On percussion the note will vary according to the amount of infiltration, consolidation, excavation of, or effusion into, the tissues beneath it. Where the infiltration is disseminated, and there is still a comparatively large amount of air-containing lung-tissue between the tubercles, one may get an impairment of the normal note which is extremely difficult to determine. In percussion of the apices one obtains the most important information, as at this point the involvement is further advanced and the signs, as a rule, are more evident. The percussion of the clavicles, supra and infraclavicular fossæ, therefore, gives one the most decided results; especially is this true if only one lung is affected, and one has the opposite lung for comparison. The difference between the two being best brought out by getting the patient to take a deep breath and then hold it, when the percussion at corresponding points on the two sides may show the impairment or dulness to be quite striking. Occasionally the dulness may be more evident posteriorly than anteriorly, and the percussion of the supraspinous

and intrascapular spaces should never be omitted. The note obtained may vary from a slight impairment to dulness, according to whether one is dealing with a disseminated infiltration or a consolidation. Over deep-seated cavities with consolidation around them one may get a note which varies very little from the normal, or may even be dull. Over superficial cavities, however, the note is hyperresonant or even tympanitic. When cavities are quite superficial one occasionally finds the typical cracked-pot sound. It is of importance in percussing the chest that the muscles should be well relaxed; this is best obtained by having the patient in a comfortable sitting position with the shoulders "dropped."

Auscultation.—The auscultatory phenomena are so numerous that I will merely mention those sounds most closely identified with the varying degree of involvement. With slight infiltration one may get merely a prolongation of the expiratory murmur and feeble breath-sounds, or occasionally harsh respiratory murmur, which may be jerky or "cog-wheel" in type. Râles when present are generally fine and crackling, and may be only noted at end of deep inspiration after a cough. As the amount of infiltration advances the respiratory murmur changes, expiration becomes more prolonged and higher-pitched until consolidation occurs, when it becomes bronchial in character. The râles also become more numerous, as a rule, and are larger and more moist in character. Over cavities of moderate size the breath-sounds are cavernous, or occasionally may be amphoric, and râles are large and bubbling. Vocal resonance is increased over any infiltrated area (except where thickened pleura or pleural effusion intervenes) in direct proportion to the amount of involvement until consolidation is reached, when bronchophony or whispered pectoriloquy may be found. The latter is, of course, best heard over cavities, especially when superficially situated. Pleuritic friction rubs may be frequently noted, and are often very hard to differentiate. Considerable consolidation around a bronchus may simulate a cavity very closely.

As to the value of percussion and auscultation in making a diagnosis, some authors claim greater precision in one, and some place more value on the other. It is a personal matter entirely, which must be settled by each one for himself. A careful application of all the methods of physical diagnosis will, perhaps, give the best results.

Urine.—Although the examination of the urine may give very few data in this condition, it should never be omitted. Glysocuria and albuminuria, while not common, occur not unfrequently, the latter in the later stages, due probably to some degenerative change in the kidney. A positive diazo reaction is a very unfavorable sign in tuberculosis; except as an aid to prognosis the test has little value in this condition. Ehrlich's dimethylamidoazobenzaldehyde reaction in the urine is not typical of tuberculosis, as it occurs in numerous other pathologic conditions. Another condition suggested as being indicative of tuberculosis is phosphaturia alternating with albuminuria.

Sputum.—In the examination of the sputum we have a most valuable and positive aid in the diagnosis, and one fortunately that is very easily carried out. The presence of tubercle bacilli in the stained expectoration is an absolute diagnostic sign of tuberculosis. The contrary, however, does not hold good, and the absence of tubercle bacilli from the sputum does not exclude this condition. A frequently repeated and carefully made examination of the sputum will in many instances reveal their presence. Roepke found the bacilli present in 67 per cent. of cases in Class II, and in 100 per cent. in those of Class III. Turban found them present in 89 per cent. of cases in Class II, and in 98 per cent. of cases in Class III.

Tuberculin.—This agent has been highly recommended by numerous observers, more, however, as a means of confirming the clinical examination than as a means of diagnosis in itself. It is useful mainly in early cases, as the results are not so good in the more advanced cases. Its field of usefulness is somewhat limited, however, as it requires keeping the patient under very careful observation for a week or ten days, although one investigator has used it in dispensary cases with fairly satisfactory results. It has not been used to any great extent, owing to the prevalent idea that it may disseminate a localized tuberculosis.

Blood.—The examination of the corpuscular elements of the blood gives very little assistance. The blood counts and findings are not constant. Especially is this true in the early stages, when it would be of most value. The absence of eosinophiles, however, has an unfavorable, and their increase in number a favorable, prognostic value.

The serum agglutination test of Arloing-Courmont is unreliable, as shown by numerous observers. The technic is also too elaborate for general use, requiring laboratory facilities for its performance.

Roentgen Rays.—Although quite satisfactory results have been obtained by the use of this method, it requires a careful special training in order to be of any value at all.

DIFFERENTIAL DIAGNOSIS BETWEEN PULMONARY TUBERCULOSIS AND CONDITIONS RESEMBLING IT.

BY H. R. M. LANDIS, M.D.,
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THE conditions simulating advanced pulmonary tuberculosis are so numerous that lack of time will necessitate only a brief reference to many of them. Therefore, I will restrict this paper to those conditions which have caused errors in diagnosis, both by members of the staff of the Phipps Institute and by members of the profession who have referred cases to the Institute.

Most of us have a definite picture of pulmonary tuberculosis in its advanced form, and a case giving a history of loss of weight, cough, expectora-

tion, hemoptysis, fever and night-sweats in association with certain physical signs is usually looked upon as most certainly tuberculous.

There are two points, however, which, if kept in mind, will obviate many mistakes. The first is that pointed out by Fowler, namely, that there is a definite "line of march" taken by the invading tubercle bacillus. The disease almost always starts just below the extreme apex on one side and pursues a downward course. The lower lobe of the lung first affected is almost invariably involved before the apex of the opposite side is attacked. This always results in the disease being in a more advanced state at the apex than in the lower lobe.

The second point of importance is the examination of the sputum in all cases of pulmonary disease. While too much stress has undoubtedly been laid on the finding of tubercle bacilli in incipient tuberculosis it can be safely said that too great laxity prevails in similar examinations in what are apparently advanced cases. Systematic examination of the sputum is insisted on at the Brompton Hospital, and this precaution alone has led to the detection of many obscure conditions.

In taking up the diseases which simulate tuberculosis it may be said that some of them are quite rare and can be dismissed with a word. Actinomycosis, aspergilesis and hydatid disease depend for their recognition on the absence of tubercle bacilli and the positive identification of the rav fungus, mycelium of hydatid booklet. The same brevity may be applied to intrathoracic growths which are usually evident from the history, pressure symptoms and physical signs.

Among the common conditions causing confusion is *chronic bronchitis.* This is particularly the case in advanced life, where the tuberculosis often runs a latent course, with a normal or subnormal temperature, and the associated emphysema masks the physical signs. The diagnosis in such cases offers considerable difficulty, and may be impossible without the finding of the tubercle bacillus. There is nothing distinctive of tuberculosis either in the symptomatology or the physical signs. Suspicion as to the true condition may be aroused, however, from the following points: The cough, while worse in winter, never entirely disappears; on physical examination it may be noted that the signs are more marked at both apices or at one apex alone; and in addition a definite history of exposure or family predisposition may be present.

Bronchiectasis.—This is a not uncommon source of error, especially in the diffuse form in which the bronchi of a lobe or even an entire lung may be dilated. The dilations may be sacculated, cylindrical or fusiform. The condition is almost invariably secondary to some prolonged inflammation of the bronchi or to induration or consolidation of the surrounding tissue. Therefore a history of prolonged bronchial inflammation, measles, whooping cough, pleurisy, and particularly pneumonia, is important.

There is no single symptom of tuberculosis which may not be present in this condition, but there are several points which render the diagnosis probable, and with the absence of tubercle bacilli it becomes almost a certainty. Cough, expectoration and dyspnea are the important symptoms. The expectoration is quite characteristic, occurring in large quantities at a time, and particularly on rising in the morning. The dyspnea is variable, depending on the extent of lung tissue involved and the implication of the right heart. Pain in the chest is frequent and important, usually indicating extension of the process to the surface of the lung. Fowler states that clubbing of the fingers is so extreme as to be of value in the diagnosis. In three cases I have seen this was certainly true.

The physical signs in the majority of the cases show the lesion to be at the base or about the root of the lung. Fremitus is usually increased, especially if fibrosis coexists. The percussion note depends on the underlying condition: if there be surrounding emphysema the note will be hyperresonant; if the dilations be large the note may be tubular or tympanitic in character; while if fibrosis be present dulness is the result. The breath sounds are bronchial or cavernous, while whispering pectoriloquy and amphoric breathing are present over a superficial dilation. The râles may be large and bubbling and of a metallic character, or, in the presence of fibrosis, superficial and crackling. The "veiled puff" of Skoda may also be present. I have met with this sign in one case. It occurs at the end of inspiration and gives the impression of a puff of air suddenly entering the dilated portion of a superficially placed bronchus.

When the dilations are confined to an upper lobe the differentiation is more difficult. In bronchiectasis of the upper lobes the dulness rarely extends above the clavicle, and the flattening below the clavicle is slight as compared to that in tuberculosis. The greatest source of error is in those cases in which there are signs of a cavity in the interscapular region. While a tuberculous cavity may exist at this point, it is rare without some evidence anteriorly.

Fibroid Lung.—Also referred to as chronic pneumonia, cirrhosis of the lung and interstitial pneumonia.

Pathologically the condition is characterized by an overproduction of fibrous tissue, which tends to diminish the size of the organ and to cause marked retraction of the chest wall. The opposite lung, unless both are involved, shows a marked degree of emphysema. It is believed by some that the pulmonary process is but a part of a general fibrosis, because of the associated arteriosclerosis and contracted kidney sometimes met with. Sir Andrew Clark, Hadley and Chaplin, in their monograph on fibroid disease of the lung, made the following divisions: (1) Pure fibrosis in which there is no tubercle; (2) tuberculofibrosis, a condition primarily tuberculous, but in which extensive fibroid changes have taken place;

and (3) fibrotuberculosis, a condition in which the primary state was fibroid, but subsequent infection with tuberculosis takes place.

Pure fibroid disease is not uncommon in children, and in these cases there is generally a history of some catarrhal affection of the lungs, either measles, whooping-cough or bronchopneumonia. In adults a history of pneumonia is frequent. Other contributing causes are bronchiectasis, inhalations of irritating substances, pleurisy, syphilis and foreign bodies in the bronchi. A long-standing empyema may cause collapse with subsequent fibroid changes. One such case came to autopsy at the Phipps Institute. Two of the authors above quoted believed the condition to be more common in children, while the third had seen more cases among adults. Cough, expectoration and dyspnea on exertion are the symptoms most commonly observed. Marked deformity, as a rule, characterizes the disease. The affected side is retracted; the ribs become approximated, or may even overlap; the spine is drawn toward the affected side, and the heart is pulled out of its normal position, the retraction always being toward the affected side. In right-sided fibrosis the apex beat may be in the fifth interspace in the nipple line on the right side.

The physical signs are variable, and depend largely on the presence or absence of bronchiectasis. When dilations of the bronchi are present the percussion note may be tubular or tympanitic in character; in their absence it is usually dull. With dilation of the bronchi the râles may be bubbling and metallic in character or fine and crackling. The breath sounds may be bronchial or cavernous, or, in the absence of dilations, feeble and distant. The emphysematous condition of the opposite lung gives a hyperresonant note, which may extend beyond the median line of the sternum, and the breathing is puerile in character. Basic heart murmurs are commonly present, usually at the pulmonary orifice, and systolic in time.

In differentiating pure fibroid disease from fibrosis with an associated tuberculosis, the presence or absence of the tubercle bacillus is of course the all-important point. In addition, pure fibrosis runs an afebrile course, the constitutional disturbances are slight, and the opposite lung shows no signs of infiltration or consolidation.

Among the older clinicians, *syphilis of the lung* was looked upon as comparatively frequent. Later the existence of syphilitic disease of the lung was questioned unless it could be demonstrated pathologically. In proof of the rarity of the disease is the experience of Fowler, who states that in a careful search among the museums of the London hospitals he could find but twelve examples of syphilis of the lungs, and in two of these it was doubtful. Recently, however, papers by Janeway, Stengel and Berg would seem to indicate that the condition is not infrequently met with.

Pulmonary syphilis may be strongly suspected if a patient presenting the physical signs and symptoms of tuberculosis has no tubercle bacilli in the sputum after repeated examinations, and in addition has evidences of tertiary syphilis. During the past winter I have seen two colored women who illustrate these points. Both came to the dispensary complaining of cough, profuse expectoration, hemoptysis (in one case), night sweats and loss of weight. The physical signs closely resembled those of advanced phthisis without cavity formation, except that in one case the signs were more marked at the base. In one case there were typical syphilitic leg ulcers, while in the other there were scars on the arms and body of a recent rupial eruption. One case has been lost sight of, but in the remaining case no tubercle bacilli have been found, and she is showing marked improvement under potassium iodide. A case reported by Stengel made a complete recovery under potassium iodide, although he had been admitted to the hospital in a dying condition.

There still remains another condition which experience has shown to be a frequent source of error, namely, *mitral stenosis*. I mention it simply to call attention to the fact that this valvular lesion is a frequent source of blood-spitting. The only cases of mitral stenosis which should offer any difficulty in determining the source of the blood are those in which there is no murmur. In these cases careful examination will usually reveal a faint thrill above the apex beat, accentuation of the second pulmonic sound, a small pulse, and that peculiar quality of the first sound which Da Costa designated as clacking.

In conclusion, I wish to emphasize the importance of keeping in mind the definite "line of march" taken by the invading tuberculous process and the necessity of systematic and repeated sputum examinations in all doubtful cases.

HISTORY-TAKING IN CASES OF PULMONARY TUBERCULOSIS.

BY CHARLES J. HATFIELD, A.M., M.D.,
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IN this discussion we are to assume that a patient comes to the examining physician with some indication of tuberculous infection. This indication is to be verified and explained; a diagnosis is to be made and the stage of the disease determined; upon these findings will depend the prognosis and treatment. A careful record of related facts is necessary in the study of any serious illness, and in no disease is the record of greater importance and interest than in tuberculosis, where a history, carefully compiled from the statements of an intelligent patient, is of immense value in helping to determine diagnosis, prognosis, and even treatment.

The records of age, sex, color, social condition, nativity (ancestral and personal) and places of residence are naturally made first. Each of these data has an obvious diagnostic or prognostic value, either in itself or when considered in connection with some significant symptom. Thus a child or a person in middle life will have a more favorable prognosis than will a young adult, or a

patient debilitated by age; a woman will present various forms of tuberculous lesions, *e.g.*, those affecting the uterus and its appendages, which require special investigation; the negro in America is peculiarly susceptible to the disease, and exhibits a power of resistance considerably less than that of the white man; a married patient offers problems in the management of the case quite different from those of the unmarried; a native American is usually much better able to order his life for health and happiness than is a foreign-born immigrant; and the knowledge of the place of residence, whether healthy or the reverse, will aid materially in prescribing for a case.

With the questions as to occupation, family history, habits of life and previous diseases, we enter upon a most interesting field of study, where we may hope to discover the actual exposure to contagion, or at least circumstances predisposing to the disease. It is certainly a gratification to be able to point to some definite association in the history, and to say, with a certainty that satisfies yourself, at least, "There the disease was contracted." The effect of occupation is a most important study. The German authorities pronounce it, when a wage earner is under consideration, of more value than the family history. In this investigation, it is by no means sufficient to know only the present calling of the patient, for a fairly large percentage of cases, having been previously warned that they are "threatened with lung trouble," have in consequence secured positions at outdoor work, as drivers or motormen; whereas, formerly they may have been tailors or cigarmakers. A safe rule is one suggested by a colleague, who is in the habit of making a complete record of all the occupations successively engaged in, and the time spent in each, since the school days. In the list of significant occupations, we can include all those that necessitate a sedentary life, in crowded workrooms, with the possibility of bad ventilation, uncleanliness and dust. In one clinic at the Henry Phipps Institute, during the past year, of 234 cases of tuberculosis, there were 23 tailors, 19 mill hands (operators upon machines), nine cigarmakers, six weavers, six seamstresses, and six clerks—these six occupations supplying almost 30 per cent. of the cases treated.

In the family history, we find most frequently, perhaps, evidence of exposure to contagion. We should have a record of the age and health of each living member of the preceding, immediate and succeeding generations. One is not infrequently able to trace infection to some near relative who has been coughing and expectorating for years, who has a chronic form of the disease that has never been recognized, and who may live long after the victims of his ignorance or carelessness have been buried. The record of family deaths with the ages at death, the fatal illnesses and the dates of death, is still more prolific of interesting facts. In drawing our conclusions, however, we must remember that all tubercle bacilli, even the most virulent forms, lose their vitality in about six months, if we are to accept Cornet's statement, based upon Kitasato's experiments. Therefore, if we are to establish a connection between the condition of our patient and the disease causing the death of a relative, we must be sure that the exposure was either before the death or very soon after. In cases where there is obscurity as to the source of contagion, careful inquiry as to the health of the more remote relatives will often be profitable. When the patient is married, the health of the consort and of the consort's family is of interest and importance. A number of cases can be gathered from the literature of tuberculosis, where a husband or wife suffering from a chronic form of the disease, before succumbing to it, has infected and buried two or more successive consorts.

The question of house infection will naturally be considered in connection with the family history. The fact that tuberculosis is a house disease has been conclusively demonstrated. Therefore, a careful questioning of the patient as to the houses he has occupied during the period of possible infection, together with the character and health of the previous inmates, is often productive of definite results.

The personal habits of a patient have considerable weight in fixing the time and manner of contagion. It is generally admitted that any vicious mode of life, which consumes vital powers and lessens tissue resistence, is predisposing to the disease. Alcoholism, for instance, certainly produces a fertile soil for any infection, and perhaps most frequently for the tubercle bacillus.

When we come to consider the history of previous diseases, we are getting close to the first manifestation of specific activity. When the patient gives a history of a comparatively recent attack of malaria, typhoid fever, pleurisy, pneumonia, or influenza, from the effects of which he has never fully recovered, he may be telling only of the acute illness which left him with a weakened system, an easy prey of tuberculous infection. How frequently, however, we can say, with almost absolute certainty, that the so-called malaria, with its fevers, sweats and slight bronchial irritation, was an acute manifestation of tuberculosis! This error in diagnosis is the one most frequently met with in clinics devoted to tuberculous cases. The same statement is true to a less degree of the history of a recent attack of typhoid fever, where again the fever, prostration, digestive disturbances and the respiratory symptoms have been tuberculous; of pleurisy, which, when primary, is very frequently tuberculous; of pneumonia, with its almost identical clinical picture; and of influenza, that convenient term for any respiratory affection not easily classified. Other diseases which may be of especial interest in the previous history are diabetes, syphilis, gout and rheumatism; and, in childhood, measles, pertussis, scarlatina and diphtheria. The record of traumatism, especially such as would

injure the thorax or cause a long confinement to the bed or room, is often significant.

When we reach this point in our investigation, we are in a position to estimate, with a fair prospect of success, the approximate duration of the disease. If we have a definite source of infection, with a history of symptoms beginning within a few months after the period of contact, the task is easy. We must always remember the extreme chronicity of the disease, and must not hesitate to go back a decade or more in order to find the source whence the sequence of symptoms originated. In this attempt to fix the probable duration of disease, we can hope for no direct assistance from the patient, as his idea of the origin will rarely include more than the beginning of the present acute exacerbation. We must bear in mind, moreover, that the determination of duration is going to affect our prognosis; the fact cannot be disputed that cases who have had tuberculosis for a long time, and who show only moderate involvement, respond to treatment better than do the more rapidly advancing cases. Whether this can be attributed to superior strength of constitution, or to an acquired immunity, it is impossible to say, although the trend of modern investigation seems to point to the latter as the correct view.

In considering the subjective symptoms, we should first record the time when the first sign became manifest to the patient. Usually, a very careful inquiry must here be made, as the patient will easily overlook a gradual loss of weight or strength, or a slight morning cough with expectoration. Next, hemoptysis, whether slight or copious, and when first apparent, must be noted. If pain is present, its location and character are of interest. The character of the cough, whether slight or excessive, worse at night or by day, should be recorded; also the amount, character and color of the sputum. Almost every patient will complain of some dyspnea, slight or marked; and we should make note of how this dyspnea is produced, whether only at night and in paroxysms (asthma) or when lying down (cardiac disease); whether it is continuous, or appears only on exertion. Is hoarseness present? If so, is it persistent or temporary? The presence of chills, night-sweats and edema should also be noted.

The condition of the gastro-intestinal tract should be carefully investigated, for upon its integrity and efficiency, we must largely depend in the modern treatment of tuberculosis. The appetite, the condition of the stomach, whether any dyspepsia or nausea is present, the condition of the bowels, where looseness may possibly indicate intestinal involvement—all these inquiries and records are of vital importance. If the patient is a woman, the periodicity and character of the menstrual flow, or its failure to appear, should be noted. The presence of leucorrhea and its duration is also a matter of interest, because of the theory held by some of our prominent specialists, to the effect that the flow is often indicative of a primary tuberculosis of the uterus or the tubes. Finally, of the subjective facts, we must inquire concerning the previous weight of a patient, recording his best weight and its date, the average weight in health, and the lowest weight since the beginning of the illness. A loss of one-third of the highest weight recorded is a basis for the gravest prognosis.

It is not possible in the scope of this paper to speak in detail of the recording of all the objective symptoms—the results of examination. It is of vital importance, of course, to keep records of the weight, pulse, temperature and respiration for each visit, as these symptoms are the best guides in prognosis and treatment.

It may be said that in an outline for history-taking such as has been given, there are entirely too many details for a practical man, who wishes to make a short cut to his diagnosis. We must remember, however, that careful study of every case of tuberculosis is of importance in the great struggle against the disease, and the assistance of every man is needed. Moreover, with a system carefully mapped out, a complete history of any case can be made in a half-hour.

The outline followed in this paper is in general the one adopted and now in process of development at the Henry Phipps Institute.

MEDICAL PROGRESS.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

Pathology of the Suprarenal Glands.—G. MARCHETTI (*Virchow's Archiv*, Vol. 177, No. 2) has carefully studied the suprarenals in all autopsies during two years, and states his observations as follows: Accessory adrenals are most common along the anterior surface of the kidney or the hilus, or in the neighborhood of the spermatic artery. Displaced portions of the gland are more common, and always remain connected with the main gland by means of a pedicle of gland tissue or connective tissue. They consist chiefly of the zona fasciculata, but are often not altered in severe disease of the gland itself. Inclusions may also be encountered occasionally in other organs, as the ovary. Venous congestion is a frequent symptom, seen most distinctly at the junction between cortex and medulla. Punctiform hemorrhages are more common than larger ones, and are encountered in intoxication (eclampsic, jaundice) or infections (typhoid, pneumonia). Hypertrophy may be primary and total in valvular disease or compensatory and total where the second organ is destroyed or compensatory and partial, where a tumor, etc., has invaded one end. The medulla never participate in the process, but in the cortex the cells are closely set. The effects of trauma were well seen at the autopsy of a man who had been run over a year prior to his death: a large coagulum was found in the kidney region, which contained many fragments of the corresponding adrenal; those which had retained their capsule were hypertrophic and functionating, while the rest had undergone degeneration. Fatty infiltration is common in diseases of the heart and vessels, acute infectious disorders and cachetic individuals. The organs will increase in size and assume a bright yellow color on section. The only case of primary malignant tumor was a small carcinoma, detected accidentally in a man who

had died of pneumonia, while secondary nodules were found in cancers of pancreas and liver. The only benign tumors seen were a fipoma and a nodular hyperplasia of the medullary substance.

Paget's Disease of the Nipple.—K. ZIELER (*Virchow's Archiv*, Vol. 177, No. 2) does not believe that carcinoma secondary to eczema of the nipple starts in one case from the flat epithelium of the skin and in another from the cylindrical cells of the excretory ducts. It is useless to discuss this question any longer, since the development of malignant tissue necessitates the presence of an entirely new type of cells, originating either from the flat or cylindrical epithelium, or both. These cells result from degeneration of normal cells already present, and are especially common in eczema. Paget's cancer is thus closely allied to cancer secondary to a number of skin affections, such as leucoplakia, lupus, senile warts, etc. The disposition toward malignancy is, however, much greater than in the other affections.

Esophageal Glands.—In fully 70 per cent. of all cases J. SCHAFFER (*Virchow's Archiv*, Vol. 177, No. 2) found glands in the esophagus between the lower edge of the cricoid cartilage and the fifth tracheal ring resembling those which normally occur at the cardia. They lead to an excretory duct lined with high cylindrical epithelial, and where they end on the surface the esophagus may be clothed for some distance with cylindrical epithelium, giving rise to the so-called macroscopic erosions. Examination of young embryos shows that these areas are derived like the rest of the esophageae epithelium—from the original stratified non-ciliated cells, but for some reason they do not acquire the cilial characteristic for this period, and later on retain their cylindrical shape, while the rest of the cells undergo metaplasia and become converted into stratified cells.

Immunity Against Streptococci.—Investigations undertaken for the purpose of obtaining information as to the identity of the streptococci found in cow's milk and their relation to those found in the human organism, are now published by D. H. BERGEY (*Univ. Penn. Med. Bull.*, August, 1904). Goats and rabbits were treated with repeated increasing doses of certain streptococci isolated from cow's milk and from human beings, for periods of from three to nine months. The sera of these animals were then tested as to their agglutinating, protective and curative properties. It was found that the serum of animals immunized with cultures of streptococci acquires an agglutinating power for all varieties of streptococci, though the agglutination occurs in somewhat higher dilutions for the homologous culture than for those derived from other animals. The agglutination reaction affords no means of definitely differentiating between cultures of streptococci of human and animal origin. The serum of an animal immunized with cultures of streptococcus shows no definite bactericidal action against such organisms. The serum of animals immunized with cultures of streptococcus possesses some antitoxic effect against the toxic action of the filtrates of streptococcus cultures. The protective and curative properties of antistreptococcus sera as at present prepared are of very slight value, as indicated by animal experimentation. No great reliance can be placed on the statements of the efficacy of the antistreptococcus sera in the treatment of streptocuccus infections, until animal experimentation gives us more definite insight into the mechanism of streptococcus infection and the manner in which the organism overcomes such infection.

Carcinoma of the Breast in a Cat.—Malignant tumors are not at all uncommon in domesticated animals, so that the finding of a typical cancer of the breast in a pregnant cat need not astonish. On examining the tumor microscopically, E. v. LEYDEN (*Zeitsch. f. klin. Med.*, Vol. 52, Nos. 5 and 6) was very much surprised to find the structure in every way the same as that of the corresponding growth in man, and, like it, many of the cells contained the so-called "birds-eye" inclusions, concerning whose nature there is so much dispute. The author still adheres firmly to his parasitic theory, and states that the inability to isolate, grow and inoculate the germ is not really an argument against its causal relation, since we are dealing, not with bacteria, but with protozoa, whose peculiarities are as yet little understood. It is impossible to explain the inclusions as merely evidences of cell-degeneration.

Constituents of the Blood Which Are Visible by Ultramicroscopical Methods.—By means of the ultramicroscope, recently devised, E. RÄHLMANN (*Deutsch. med. Woch.*, July 14, 1904) examined the secretions from diseased mucous membranes, and found, aside from the emigrated white cells, numerous bodies which were apparently derived from the epithelium and consisted of bits of protoplasm and nuclei. These had the property of changing both their shape and position. It was also found that certain changes occurred in the blood plasma as well as in the cells, which may serve to explain the rôle which the blood cells play in the metabolic processes of the organism. The conclusions are as follows: It is well known that a great number of red cells derived from the erythroblasts of the red bone-marrow and other places are constantly thrown into the circulation, and from the appearances seen in the ultramicroscope it seems proper to believe that the mature erythrocytes are broken up into very minute particles in order to make room for these accessions. The duty of these particles is to regulate metabolism within certain limits in every part of the body.

Leucocytes of Pus.—All forms of leucocytes could be detected by J. LEUCH'S (*Virchow's Archiv*, Vol. 177, No. 1) in pus examined by the eosinate of methylene blue stain. The neutrophile, polynuclear elements are most abundant and nucleus degeneration is very common; one type very frequently encountered is a neutrophile cell, with very dark, ball-shaped nuclei not giving evidences of chromatic network. Eosinophiles are frequently absent at first and plentiful later on, at a time when micro-organisms can also be detected. There does not seem to be any difference in acute or chronic pus, since eosinophiles occur in about 50 per cent. of each. They are generally better preserved than neutrophiles. Mast-cells are also frequent, but the granules rarely retain their original form, but generally appear coarse and irregular. Hymphocytes are often hard to distinguish from degenerated leucocytes or free, swollen nuclei and their protoplasm may be lighter or darker than the nuclei. Micro-organisms can be well demonstrated with the stain and are found free or within the neutrophiles. In most serous fluids examined and lymphocytes predominated, especially where tuberculosis was probable.

PHYSIOLOGY.

Relation of Blood Platelets to Coagulation.—The simplest way of obtaining blood platelets suspended in normal plasma for study is to let a drop of freshly-drawn blood fall upon a smooth piece of paraffin. The blood will not coagulate, but the red and white cells soon settle to the bottom, while the platelets will rise, so that if the upper surface of the drop be touched with a coverslip after twenty to thirty minutes, the latter may be obtained almost pure. If larger quantities are desired, a paraffined glass canula is inserted into the carotid, the blood drawn into a paraffined graduate and then allowed to settle in the

ice-chest. It is not probable that the platelets are formed from either red or white cells, since the latter show no signs of breaking up and retain their ameboid motion, and hemoglobin cannot be detected by the spectroscope. The theory that they are independent elements is still further strengthened by the fact that they may be observed circulating in the blood of the uninjured wings of bats. K. BURKER (*Münch. med. Woch.*, July 5, 1904), describes the bodies in question as follows: They are lentil-shaped and about three mikra in diameter, but occasionally present one or more processes so that they appear not unlike spermatogoa. They are furthermore colorless, possess ameboid motion and, with proper strains, show a central body. If examined in the fresh specimen, they do not retain their integrity very long, but soon break up and form the nuclei for long strands of fibrin. The coagulation of blood is influenced considerably by temperature and also varies much during the day, but is approximately the same for different individuals at the same temperature and same hour. There is a direct relation between the number of disintegrated platelets and the amount of fibrin and influences which retard the formation of the latter will also delay the breaking down of the cells. Various chemicals also influence both processes in the same way so that there can hardly be any doubt that they are closely related to each other. This is rendered still more likely by the fact that the weight of the platelets approximates the weight of the fibrin formed.

The Influence of Potassium Upon the Heart and Blood Vessels.—The intravenous injection of salts of potassium affects the heart and blood-vessels in a twofold manner. By direct action upon the circulating organs and by vasomotor action, according to L. BRAUN (*Pflüger's Archiv*, July 9, 1904). Only in the smaller doses do the potassium salts seem to have a stimulating action upon the cardiac muscle. Large doses of potassium damage the heart; removal of the potassium from the latter results in a speedy disappearance of the bad effects. Potassium has no vasodilator effects.

The Influence of Sea-Climate and Sea-Bathing Upon Metabolism.—The familiar experience that a stay at the seashore, together with a course of sea-baths, results in a stimulation of the bodily metabolism, is sustained by the experimental observations of A. LOEWY and F. MÜLLER (*Pflüger's Archiv*, July 9, 1904). An estimation of the changes in the oxygen consumption and the production of carbon dioxide was made. Individuals differ in the degree with which they react to the climate and baths of the sea. Three types may be distinguished: One shows no reaction to the climate and a slight reaction to the baths; the second type shows in the beginning a strong but afterward a diminishing reaction to the climatic factors, but displaying throughout a marked reaction to the baths; the third type shows a continued reaction to both factors. Moreover, the results vany in the same individual. Thus, west winds and an increased force of the waves increase the body metabolism. The stimulation of metabolism would go hand in hand with the stimulation of appetite, digestion, and psychic functions. The former, as well as the latter, is of reflex origin, the stimuli being various physical factors, such as lower temperature, movements of the air, etc. One cannot, however, predict the manner or degree in which the individual will react to these stimuli. The increase in appetite and the increase in metabolism have nothing to do with each other; they arise independently, and may occur singly or coincidently.

The Resuscitation of the Cranial Cells.—The recent epoch-making experiments performed by Kuliabko, in causing the human heart to beat as late as forty-eight hours after the death of the body, might have aroused the hope that it would in time be possible to bring the dead back to life. The above observer, in commenting upon this subject, scouted this idea as vain and fruitless, in pointing out that death starts first of all in the delicate structures of the central nervous system, and that it would be necessary to revive the latter before we could even consider the possibility of starting again the bodily machinery. An experimental investigation of the changes that accompany the death of the cerebral centers was made by F. MÜLLER and A. OTT, (*Pflüger's Archiv*, July 9, 1904). The authors endeavored to determine whether one is justified in maintaining the conception of the excessive sensitiveness of the gray matter to a cessation of the circulation of the blood, and whether it might not be possible, by means of a renewed and artificial circulation, in restoring the oxygen supply and removing the accumulation of waste-matters, to bring back the functional activity of the cranial cells. Nissl's method has revealed profound changes in the structure of nerve-cells even before death in animals slightly wounded. The researches of the authors show that immediately upon the cessation of the flow of blood to the brain, substances reacting acid to litmus-paper are quickly formed. The renewal of the circulation by means of a warm solution similar in composition to blood-serum results in no restoration of cervical activity, even though oxygen-starvation or an accumulation of metabolic products be guarded against.

MEDICINE.

Polymyositis and Polyneuritis in Measles.—The first case reported by W. JESSEN (*Berl. klin. Woch.*, August 8, 1904), deals with a woman of thirty-two years, who, ten days after the breaking out of an attack of measles, developed a diffuse painful swelling of the muscles, accompanied by edema. There was no enlargement of the spleen and the mucous membranes remained intact. A recovery came about very slowly. A polyneuritis after measles has thus far only been observed in two cases, to which E. EDEN (same journal), adds a third. A girl of sixteen years developed otitis media and bronchopneumonia as sequela to measles. She also presented hyperesthesia of the skin and tenderness on pressure along the various nerve trunks. The symptoms gradually subsided and were attributed to the measles as no other cause could be found for their appearance.

Diabetes Insipidus Treated by Strychnine Injections.—In the case reported the patient, a man of forty-nine years, developed diabetes after a fall which resulted in a severe shock to the nervous system. His previous health had been excellent. B. LEICK (*Deutsch. med. Woch.*, August 11, 1904), states that he tried various methods of treatment without success, until he began the injection of strychnine, as recommended by Feilchenfeld. The nitrate was given in daily quantities of from 0.0025 to 0.005 gms. for twenty days. The urine, which had amounted to 8,000 c.c., continued to steadily decrease in amount. The drug had to be stopped at the end of twenty days, on acount of the symptoms of intoxication, but the urine continued to decrease in amount down to 2,400 c.c. The patient's general condition also improved and at the end of four

weeks the urine was about 2,000 c.c. daily and the man was practically cured. No explanation of the action of the drug in this case is offered by the author.

Treatment of Chronic Colitis.—It is the opinion of J. SHOUP (*Am. Med.*, August 27, 1904), that the various types of chronic colitis are simply different stages of the same disease and may all be treated in a similar manner. Most of these cases occur in women and are accompanied by gastropsis, enteroptosis or nephroptosis. SHOUP believes that the condition is due to the entrance into the intestine of improperly prepared chyme, which by causing irritation and inflammation, finally brings on a chronic colitis. Where a ptosis of the internal organs is present, he overcomes this by supporting them with a corset, put on while the patient is lying down and which is laced from below upward. The treatment is reviewed as follows: The attack of pain which precedes the passage of mucous may be relieved by a hypodermic of morphine and atropine. Thorough evacuation of the bowels is secured by large doses of castor oil and high enemas of oil or alkaline solutions. Diet must be selected for the individual case, after a chemical examination of the stomach contents has been made. Digestion must be assisted and fermentation allayed. The bowels may be kept open by oils given by mouth, which act both as laxatives and lubricants. When necessary, astringent enemas may also be given. Sufficient rest is important, especially after meals, and, when practical, a change of air and scene is useful.

PEDIATRICS.

The Absorption of Fats in Infants.—An experimental investigation of the varying capacities of the absorption of fats in the infantile intestine was made by P. NOBÉCOURT (*Rev. Mens. des Maladies de l' Enf.*, August, 1904). The amount of fat absorbed is found by taking the difference between the amount taken in with the food and the amount found in the feces. In this way may be obtained the coefficient of absorption. It is necessary, however, to take into account the quantity of fat ingested, for, in fact, if the infant take very little fat, nearly all of it may be absorbed, while, on the other hand, if a great deal is ingested, a large amount will be found in the feces, even though the digestive and absorptive powers may be quite marked. In general, healthy, breast-fed infants have a very marked absorptive capacity for fats, even though they be permaturely born. A more or less constant impairment of this capacity is found in weak, dyspeptic infants, in infants sick with intestinal or pulmonary infections, in cases of myxedema. In convalescents from measles the absorption of fats is normal. In determining the kind of food the infant should have, it is necessary to take account of its fatty absorption coefficient. In infants who ingest a quantity of fat too great in proportion to the amount absorbed, it is necessary to diminish if not the quantity of milk, at least the quantity of fat. In certain cases skimmed milk or buttermilk produces excellent results.

The Significance of Bacteriological Methods in the Diagnosis of Diphtheria.—Most practising physicians have encountered cases of mild sore throat in children, looking not at all like diphtheria, and yet bacteriological examination revealed the presence of the diphtheria bacillus. The question would then arise. Is it a case of diphtheria, or of ordinary tonsillitis, the Klebs-Löffler bacillus being present, as it is in many normal throats. A critical study of the entire subject of the bacterial diagnosis of diphtheria is made by B. CZERNO-SCHWARZ (*Arch. of Kinderheilk.*, Vol. 39, Nos. 1 to 3), with the following conclusions: Of undoubted value is the negative result in the repeated investigation for the Klebs-Löffler bacillus. The bacteriological method has revealed that even membranous anginas, membranous larygitides and croup may be non-diphtheritic. Rauchfuss, in 1894, published a learned array of such cases. Since that time this fact has received general acceptance. The author observed, among others, seven cases of laryngeal stenosis with a clean throat (which cases always arouse the suspicion of diphtheria), in which repeated examination did not reveal the presence of the Klebs-Löffler bacillus. The author is equally positive as regards the positive result of bacteriological examination, in cases in which the clinical picture is one of diphtheria. The author agrees with Schabad that hardly any one at this date would fail to make the diagnosis of diphtheria if the clinical picture is of this disease and if the culture is positive. On the other hand, in all those remaining cases in which the clinical picture and the positive culture do not agree, one has no certain criterion upon which to base a diagnosis. In all these cases a diagnosis of diphtheria should be made, at least until the time when bacterial diagnosis shall have made further progress, not alone upon the subject of the presence of the Klebs-Löffler bacillus, but also in the ability to recognize the intoxication of the organism with the diphtheria poison. In order to prevent misunderstanding, the author adds that he has treated of the scientific aspect of the diagnosis of diphtheria, and that he is not opposed to the practical measures taken when the Klebs-Löffler bacilli are discovered in the throats of patients. Those whose throats contain these bacilli frequently develop the disease later on, or else infect others with the disease, and for these reasons prophylactic measures are justified, without respect to the diagnosis of the primary disease or absence of disease in the throat, in which latter case the bacilli may be merely accidental parasites.

Treatment of Hydrocephalus.—A case of the chronic internal type is reported by H LÖWENBURG (*Am. Med.*, Aug. 6, 1904), which he treated by lumbar puncture. The child, about twenty months old, had from 50 to 60 c.c. of cerebrospinal fluid withdrawn by puncture once a week for a period of two months. The child improved mentally and physically and the head also became reduced in size. Death was finally due to pneumonia following measles. The writer considers that the following conditions must be present in each case before lumbar puncture can be practised: Free communication must exist between the ventricles and the subdural spinal space, which is shown by the fact that after the puncture, the fontanelle becomes scaphoid. The head must be compressible. The bones must be flexible and there must be no evidence of ossification in the fontanelle or the sutures. Ossification is usually well advanced after the second year, and, therefore, treatment must be instituted before this period. Lumbar puncture is preferable to direct tapping of the ventricles, as there is an entire absence of all danger of the untoward complications following the latter.

OBSTETRICS AND GYNECOLOGY.

Secondary Abdominal Pregnancy.—Two interesting cases are reported by F. PRUMANN, (*Zeitschr. f. Geb. u. Gyn.*, Vol. 52, No. 2). In one an intraligamentous pregnancy developed from the left tube,

which ruptured, but the fetus continued to develop in the abdominal cavity. When two weeks over time the woman was operated upon and a living child extracted. The placenta was adherent to and derived its nourishment from the intestines. The hemorrhage prohibited its removal and it was sewed into the abdominal wound. The woman died shortly after in collapse. The other case developed from an intestinal pregnancy in which a seven-months' fetus remained in the abdominal cavity for a year before operation. It had grown fast to the fundus uteri. The woman recovered. In this instance the fetus continued to grow, although the placenta remained at the original interstitial attachment.

Hemorrhage in Labor.—A sudden severe hemorrhage is the most alarming condition that the obstetrician has to meet. Accidental hemorrhage is due to premature separation of the normally implanted placenta. In considering its etiology, J. ROSENBERG (*Am. Jour. Obstet.*, August, 1904), mentions exophthalmic goiter as a predisposing cause. Traumatism, emotion, hydramnios, multiple pregnancy and shortness of the cord may all produce premature separation of the placenta, but syphilis, nephritis and uterine tumors are the most important factors. The symptoms are those of shock from loss of blood, abdominal pain, abnormally large uterus, bulging and tenderness over the part corresponding to the placental site. The absence of placenta previa confirms the diagnosis. The prognosis for mother and child is bad in concealed hemorrhage; in external hemorrhage the mother's chances are better. The treatment should be rapid delivery. If the soft parts are dilatable, version, forceps or craniotomy may be resorted to. If the cervix is intact it may be incised or dilated with the fingers, metal dilators or Barnes' bag. "Conservative treatment" helps the woman bleed to death. A disease endometrium and uterine subinvolution predispose to placenta previa. The main symptom is hemorrhage, which is rare before the middle of the seventh month and may not appear before the end of pregnancy. The diagnosis depends upon the recognition of the spongy placental tissue. The treatment should aim to minimize the loss of blood and deliver in the interest of the mother. If the cervix is not dilated a firm gauze tamponade will usually arrest the bleeding and bring on labor pains. In marginal implantation, when the cervix will admit a finger, rupture of the membranes is advocated. A version should be done and a foot brought down out of the vulva; if the implantation is central and the hemorrhage profuse, the breech should be left in utero to act as a tampon and dilating wedge. A child should never be forcibly extracted through a partially dilated cervix. Postpartum hemorrhage may follow accidental hemorrhage and plancenta pervia caused by uterine overdistention, general anemia and muscular relaxation. A hemorrhage before delivery of the placenta is due to a partially separated placenta usually ascribable to undue interference in the third stage of labor. The treatment consists in emptying the uterus by Credé's method, using the hand, if necessary. True post partum hemorrhage occurs after expulsion of the placenta and is due to atony of the uterine muscle. If the blood is bright red and the uterus contracted the source is a torn cervix, which should be repaired at once. If the uterus is large and buggy, the blood dark and clotted, the hemorrhage is from the placental site and calls for the following treatment: Massage of the uterus, injection of ergot, compression of the abdominal aorta, hot or cold intra-uterine douches with vinegar. If these measures fail, the uterus and cervix should be packed with gauze. Enteroclysis and hypodermoclysis should be resorted to, as may be necessary; intravenous infusion should be reserved for desperate cases. Raising the foot of the bed, auto-infusion, stimulants, hot cloths on chest and abdomen, ice-bag over uterus, all have value. Intra-uterine packing should be removed in twenty-four hours and followed by hot irrigations.

THERAPEUTICS.

Formaldehyde in Milk.—The germicidal action of this substance in milk and its gradual disappearance from the latter has been made the subject of an experimental study by D. RIVAS (*Univ. Penn. Med. Bull.*, August, 1904). He found that small amounts (1:10,000 to 1:100,000) of formaldehyde added to the milk will gradually disappear from such milk in the course of twenty-four to thirty-six hours. This amount of formaldehyde exerts some detrimental influence upon the activities of the bacteria in the milk, as shown by the relatively lower bacterial content of such sample when compared with control samples. Samples of milk containing such small amounts of formaldehyde acidify more slowly, and do not coagulate as early as control samples. The fact that samples of market milk show unusually good keeping qualities and yet apparently do not contain formaldehyde, should at once raise suspicion that these samples may have had formaldehyde added to them, and that in time the formaldehyde has disappeared from such milk.

Therapeutic Value of Dreyer's Method of Phototherapy.—This is based on the assumption that the injection into the tissues of a solution of erythrosin renders them more sensitive to the action of the red rays and permits the latter to penetrate to a greater depth than ordinarily. B. SPIETHOF (*Berl. klin. Woch.*, July 18, 1904) reports the results of his clinical experience with this method in six cases of lupus, three of which had been treated rather unsuccessfully with the ordinary Finsen rays. The others had not been treated at all. He found that the reaction after exposure to the Finsen rays is much more intense where it has been preceded by an injection of the erythrosin than where this has been omitted. Animal experiments showed that the latter substance itself caused a reaction when used in 1 per cent. solution, although none was noticed with the use of the 0.25 per cent. solution. The effects obtained are therefore a combination of two factors—the rays and the erythrosin. The author had practically negative results with the method and no better effects were obtained in those cases where the injections were used than in those where they were omitted. He does not feel encouraged to ascribe much practical value to the procedure.

Treatment of Hemorrhoids.—According to D. PROEBSTING (*Zeitsch. f. klin. Med.*, Vol. 53) all the symptoms of piles are due to the fact that the lower rectum is never completely emptied, but that small masses of feces remain behind, which dry out to hard scybalous masses and set up a spasm of the sphincter. To avoid this spsam, 80 to 100 grams of cold water should be injected into the rectum after every defecation. When cold water is contra-indicated owing to bladder trouble, etc., lukewarm water may be employed. If the spasm and its concomitant symptoms, such as itching, are already present, lukewarm water should always be preferred, since cold water will increase the spasm.

Adrenalin in Hemophilia.—The admixture of this drug with ergotinine citrate has much to commend it. ERNEST FRANCIS (*Brit. Med. Jour.*, May 28, 1904) Chief

Medical Officer of Bengal Railway, recites the case of a male Hindoo Brahmin, thirty-two years of age, whom he was called to see for the purpose of controlling severe hemorrhage from the mouth, which having come on without apparent cause, had lasted for six hours. The patient presented the usual signs of partial exsanguination. The uvule was tremendously engorged 2½ inches in length and bleeding freely. Partly because of the necessity of hurrying as well as on account of the difficulty of getting a history from this wealthy high-class Hindoo, no delay was made, but the engorged organ was seized with the forceps and cut off. The patient died six days later from intestinal hemorrhage, but it is of interest to note that a hypodermic injection wound was immediately controlled by the use of adrenalin, and the hemorrhage from the wound in the pharynx, which because of the nature of the lesion was large, was also entirely stopped by the above-mentioned drugs.

Therapeutic Value of Lumbar Puncture.—Lumbar puncture is of great diagnostic value, for it will determine the presence of pus or of an excessive amount of serum, and it will also enable a bacteriological examination of the spinal contents. In therapeutics it is, however, more limited. T. WERTHEIMBER (*Münch. med. Woch.*, June 7, 1904) has seen the best results in serious meningitis, that peculiar disease of children, secondary to infectious diseases and characterized by hyperemia of the retina or choked disk, retention of urine, slow pulse and slight fever. Most cases will die suddenly after three to five months, unless the excessive cerebrospinal fluid is drawn off repeatedly. Recently good results have been seen in chlorosis; the severe headache and vomiting will stop here almost at once if 30 to 60 c.cm. of fluid are removed. The meningitis of children is also benefited and often cured.

Adrenalin in Pulmonary Hemorrhage.—It is well known that after the administration of this drug, the blood pressure increases. This increase is so considerable that it can readily be noted at the wrist. DUNCAN MACDONALD (*Brit. Med. Jour.*, May 28, 1904) recites the history of a case of a single male twenty-eight years of age, who four years ago developed the usual signs of pulmonary tuberculosis. After about four years he began to have severe hemorrhages, which were treated after the usual routine method. So far as the ultimate issue of the case goes, the adrenalin did no good, for fatal hemorrhage occurred one week after its administration was commenced. It did not, however, interfere with digestion, and if it did no good, it is certainly safe to assert that it did no harm.

Treatment of Hemorrhoids by Oscillatory Currents of High Tension.—The widely recognized fact that malignant change and growth is apt to take place as a result of chronic low-grade inflammation lends to the minor ills of the rectum an importance which they had not previously attained. T. J. BOKENHAM (*Lancet*, July 2, 1904) recites his experiences of Doumer's method for treating hemorrhoids and fissures by high-frequency currents. He cites that the method is quickly successful in healing fissures. It is valuable in relieving pruritis ani. It is also valuable in the treatment of internal and external hemorrhoids, particularly in their early stages, where extensive thickening has not taken place. The author has used it in over 100 cases of rectal lesions. The exact form of the electrode is probably of very small importance, the point being that it must be long enough to pass through both sphincters and with such diameter that its surface will touch every area of the parts. A vacuum electrode of such high vacuum that there are produced in it abundant X-rays is less unpleasant to the patient and has less therapeutic action. The duration of each application should be about fifteen minutes, and in many cases five minutes is better. The results leave much to be desired in the matter of effecting permanent cures, but they are probably, in the opinion of the author, superior to any other form of treatment except operation.

Sinusoidal Current and Circulatory Organs.—It has been alleged that fresh-water baths, through which the sinusoidal alternating electric current is conducted, have proved of value in cases of cardiac debility and have cured cases of dilatation with muscular weakness. PAUL C. FRANGE (*Dublin Jour. Med. Sci.*, July, 1904) has investigated the action of such baths on the volume and frequency of the pulse, the outline of the heart and on blood pressure. On an average the pulse rate decreased after the bath by five beats per minute, the blood pressure increased by 8 mm. of mercury. In some cases a single electric bath was sufficient to remove a certain amount of cardiac dilatation. Such baths were recommended as a valuable adjunct to, but not in lieu of, the effervescent brine baths of Nauheim.

Alkaloids of Jaborandi.—A research into the physiological action of the alkaloids contained in jaborandi leaves was made by C. R. MARSHALL (*Jour. of Physiol.*, May 3, 1904) with the following results: Jaborandi leaves contain three alkaloids—pilocarpine, isopilocarpine and pilocarpine. Isopilocarpine only occurs in small quantities, and pilocarpine only in small amounts in *Pilocarpus jaborandi Holmes*. No substance corresponding to jaborini has been found in the leaves, either chemically or physiologically; but a substance possessing an atropine-like action is present in the jaborine of Merch, which, however, consists mainly of pilocarpine or isopilocarpine. Pilocarpine eats up the so-called nerve-endings in the heart, and its action is comparable in nearly all points with that obtained by electrical stimulation of the vagus. A small dose of atropine is able to counteract for a definite time an excessive amount of pilocarpine. Small doses of pilocarpine increase the sensitiveness of the vagus to electrical stimulation. Large doses, if injected during electrical stimulation of the vagus, are practically without action. The antagonism of pilocarpine and antropine is physiological. Isopilocarpine acts like a weak pilocarpine. In efficient doses it is about six times weaker. In large doses it is about twenty times weaker. Pilocarpidine is still weaker than isopilocarpine. The homopilopic portion of the pilocarpine molecule acts at least as an interacting to haptophore group. Solutions containing the hydroxy-acid corresponding to the lactone-pilocarpine are inactive. The influence of the glyoscaline part of the molecule has not yet been determined.

Action of Strophanthus.—In summing up the pharmacological action of strophanthus, G. GÜNTHER (*Therap. Monatshft*, June, 1904) states that this drug is a pure heart-muscle poison, which kills by bringing about diastolic cessation of heart-action. Intoxication gives rise to characteristic changes in pulse and blood-pressure which differ from those caused by digitalis, mainly in the absence of vagus irritation. Strophanthus also brings about vascular contraction, but less so than digitalis, and it seems to have a specific action upon the vomiting center. The only antidote is artificial respiration; neither morphine nor chloralhydrate possess any efficacy.

Maretin, A New Antipyretic.—Very favorable reports on maretin, as an antipyretic in the fever of consumptives, is contained in a short article by D. ELKAN (*Münch. med. Woch.*, July 26, 1904). He finds that the drug depresses the temperature slowly without causing collapse or excessive perspiration and without in any way influencing respiration,

digestion or circulation. Bad after-effects or cumulative action were never observed. The drug is cheaper than pyramidon and may be given in doses of 0.5 grams once daily, or half this amount twice daily. It is only slightly soluble in the usual solvents.

Morphine in Heart Disease.—There is no reason to look upon morphine in its usual therapeutic doses as heart-poison and to consider it contra-indicated where a heart lesion is present. K. GRASSMANN (*Münch. med. Woch.*, November 28, 1904), states that sudden death may occur after the use of morphine, but that this is just as unavoidable as collapse in chloroform necrosin. Great care is, however, necessary where respiratory complications exist, especially if these are acute, and also in acute processes of the endo and myocardium. Morphine can be employed without fear in purely nervous disturbances, especially in nervous angina pectoris and in organic angina small doses are indicated. The drug should never be withheld in chronic cardiac dyspnea, and in excited and sleepless patients it plays an important rôle as sedative before digitalis is begun.

NEUROLOGY AND PSYCHIATRY.

The Neuron Theory.—Recent research has shown, according to A. BETHE (*Deut. med. Woch.*, August 11, 1904), that the neuron theory, as first advanced, no longer holds. There are certain facts which have been contradicted and considerable doubt exists regarding the validity of others. It is now stated that the neuron can no longer be looked upon as cell unit, because the latter embryological and historical findings show that at least the axis cylinder processes of peripheral nerves are of multicellular origin. The demonstration of autogenous regeneration has apparently also confirmed this view. It is likely that, in addition to the neuron complexes, there are other nerve elements which are independent of the former. In every nerve plexus, in both vertebrate and invertebrate animals, the cells are connected by well marked anastomoses. In the central nervous system of snails and crustaceans, fibrillary connections between distinct neurons have been demonstrated with certainty. In vertebrates such relations have not been fully proved, but there is sufficient at hand to warrant the belief that they are probably present. Bethe claims that the neurons do not represent trophic, or even functional units. He thinks that the name may be retained and applied to the complex of ganglion cell, dendrites and cylinder process, as it furnishes an excellent conception for a teaching scheme.

The Social Causes of Alcoholism.—A statistical study of the various social causes of alcoholism was made by W. C. SULLIVAN (*Jour. of Mental Sci*, July, 1904). It is necessary to distinguish two opposed types of drinking, namely, the drinking associated with conditions of relative luxury (convivial drinking), and the drinking associated with conditions of relative misery, the result of bad industrial circumstances. Convivial drinking often leads to drunkenness, but does not tend very much to chronic alcoholism. Industrial drinking, while leading also, though less immediately, to drunkenness, tends rapidly and fatally to chronic intoxication. From a statistical point of view, while chronic alcoholism always implies the existence of drunkenness, the latter by no means implies the existence of chronic alcoholism. In England this divergence is best seen in the prosperous mining districts, which by reason of their prosperity are at once more drunken, but less alcoholic, than any other part of the country. The graver social evils that are in any important degree caused by alcohol are related to the chronic intoxication, and are, therefore, mainly due to industrial drinking. While educational, religious and similar influences can control the excesses of convivial drinking, they have but little action on industrial alcoholism, which can only be checked by raising the standard of living, and, in a minor degree, by such methods as restricting the facilities for obtaining alcohol during work hours, providing hygienic substitutes, and so forth.

SURGERY.

Clinical Experience with Renal Decapsulation.—This method of treating certain cases of Bright's disease, as suggested by Edebohls, was tried by P. ROSENSTEIN (*Deut. med. Woch.*, July 28, 1904), in a series of six cases. The general result was unsatisfactory. One patient died from the operation, one grew worse, two were not influenced at all, and the remaining two showed some improvement. Rosenstein believes that the favorable results secured by Edebohls were due to the fact that these were not true cases of nephritis, but were merely inflammatory processes brought about by an abnormal mobility of the kidney. Moreover, among the cases reported by Edebohls were nine which were designated as presenting a unilateral Bright's, which, Rosenstein claims, does not exist, but that the process is always bilateral. The mortality which attends renal decapsulation 26 per cent. is considered by Rosenstein to label the operation as a very dangerous one. He affirms that cure has not resulted in an undoubted case of Bright's from this operation. The following improvements were noted in his two cases: Objectively, in one the slight edema disappeared, but there was no change in the albuminuria; subjectively, in another case, the headache and visual symptoms which were present before operation disappeared.

Fibromyxosarcoma of the Sacrum Treated by Cataphoresis.—The patient, a woman of twent-six years, presented a hard growth in the posterior portion of the pelvis, for which operation had been attempted and given up. There was a history of two difficult labors previous to the appearance of the tumor. G. B. MASSEY (*Am. Med.*, August 27, 1904) reports the case and the result of his method of treatment. The patient was anesthetized and placed on a negative pad on a cot. An incision was made over the upper part of the coccyx and a sharp pointed zinc-mercury electrode was introduced and thrust through the healthy tissues about the coccyx into the tumor, so as to avoid injuring the sphincter ani. A current of 1,600 milliampères was slowly turned on, which developed the ionized chemicals by electrolytic destruction of the anode and dispersed them radically from the electrode, thus necrosing and sterilizing an increased area of skin, subcutaneous tissue and malignant growth. The current was used for three hours, and the necrotic area covered three inches. Twenty-one days later three of the coccygeal bones and one-half of the tumor sloughed out through the opening. A second application was made a month later, 1,200 milliampères being applied for two hours, and sixteen days later the remainder of the mass came away, followed by the rest of the coccyx. The patient made a good recovery, and seven months after operation presented a useful rectum and only a small sinus. The histological examination showed the tumor to be a fibromyxosarcoma.

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SATURDAY, SEPTEMBER 17, 1904.

AN OUNCE OF PREVENTION AND THE POUND OF CURE.

THE echoes of the requisition for a hundred thousand square yards of wire gauze mosquito netting, by the Commissioners of the Panama Canal, are still reverberating through the daily press. And yet a million square yards would not be too much (as Dixey said about the tidies), for mosquito netting, when we consider what great practical good its use will accomplish. For the bed of the forty-seven miles of the projected canal will be scarcely a bed of roses, while the canal itself will resemble anything but the beauteous stream that meandered through the Garden of Eden. Now, if any one thing has been definitely proved by the experiments of late years it is that both malaria and yellow fever are disseminated through the agency of mosquitoes, and the voices of both the *Stegomyia fasciata* and the *Anopheles* are particularly loud in that particular land. There will be, of course, much excavation of fresh earth, and in the rainy season the results will be the formation of innumerable marshy pools where the mosquitoes will propagate in vast numbers and then carry the seeds of these diseases from one encampment to another.

That the death rate will be enormous under any circumstances is evident, and any efforts of those in charge of the undertaking to lessen it from the fearful height that it attained under the régime of de Lesseps, should be applauded and encouraged by the press and not be hampered and curtailed by the cry of petty economy, or ridiculed from that crass want of knowledge that seems to be characteristic of the daily newspaper when dealing with scientific subjects.

There are already some dozens of barracks built by the former company within easy distance of each other along the banks of the proposed canal, and it is now the intention of those in charge to protect all the windows and doors of these quarters with netting, and to see particularly that the latrines of the men are so guarded that the mosquitoes will be unable to enter. In order to accomplish this the gauze is to completely envelop the entire structure, as one house might be built within another. As to the laborers themselves, it is more than a difficult problem to handle. The last lot were the veriest scum of the earth; the refuse of all nations, worn and broken down by ill-health. Racked by fever and dissipation they would have been vile by comparison with much more pleasing prospects than can be found anywhere on the Isthmus of Panama. Always mutinous, constantly fighting with each other, and endowed with that cheerful feeling of hostility toward strangers, that was so characteristic of the early days of Marblehead and which is now pathognomonic of Port Said, the wonder is, not that they died hourly, but that the majority of them succeeded in living at all.

The only possible solution of the problem would be the introduction of the Chinese coolie, who is the very best type of laborer for that particular form of work, that the world has ever produced. But the immigration laws in regard to the Mongolian are very strict, as the American workingman, and through him his Congressman, prefer to be ruined by anything rather than "Chinese cheap labor," and any efforts to influence Congress on the eve of a general election would be more than futile. They might, it is true, be landed in Mexico, which is still open to the Chinese, or be imported at the other end of the canal at Panama, but the labor unions have discovered this and the cry has already been raised that the canal strip is American territory, under the American flag, so that the labor-seeking spade of poor John will hardly turn the soil of "an

earthy to-day, nor yet of a dusty to-morrow." All this does not seem to hold out much hope for a great improvement in the personnel of the laboring force, and the reign of the beach-comber and cutthroat of the past will probably, like history, repeat itself, but with the sanitary restrictions, discipline and improved commissariat of the United States Government behind them it will certainly be in the power of the Commissioners to greatly ameliorate the condition of the working gangs.

Then, too, there is no cloud without its silver lining and the darkest hour is followed by the rising dawn, so that the proposition of Mr. William Growley, of Toledo, will not only add strength to the hearts of those delving in the Isthmian wilds, but will carry balm and comfort to the cherished ones at home. For with it comes the assurance that they will again behold the faces that they knew and loved, and that the grave has been robbed by him of its victim, while death itself has lost its sting. That Mr. Growley will be able to accomplish all that his friend Mr. Calloway states in his behalf we have no doubt. There is a certain straightforward-businesslike method in his communication, that is calculated to inspire confidence in his mercantile integrity, and though his postscript perhaps smacks overmuch of "graft," yet a great deal can be excused in the enthusiasm of a friend, which may not be politic, but is undoubtedly sincere. The letter, which was delivered to a newspaper correspondent, supposed to be in touch with the members of the Commission, is as follows:

DEAR JIMMY: This will be presented to you by my old friend William Growley. We call him "Bill" here in Toledo and I want you to go to the front and hustle for him. Perhaps you remember Bill's place in Summit Street? He has a good business in the undertaking line and desires to extend it. In other words, Growley thinks that there is a chance for him on the Isthmus. He has heard that men die there by the hundred every day. What he wants is the contract to bury those who fall by the wayside, so to speak. I heard you speak of Admiral Walker when you were here last summer and I told Bill that you were just the chap to help him, and I know you will—for my sake. Go to the front, old man, and see if you can't land this contract for Growley. He is a good fellow every way and can get all the necessary testimonials.

The boys here are all well and join me in sending you our best wishes. Yours, as ever,

JACK CALLOWAY.

P. S.—Growley is an A1 embalmer, and, if he gets the contract, will fix up the friends of the Commission who happen to die on the Isthmus in bully shape to send home. J. C.

To all of this we can only say "Amen." J. C. is evidently not an angel, as he has butted in where they proverbially fear to tread. But while we wish him well, we most sincerely trust that if his friend secures the contract that he will not be called on to return his favors professionally to the members of the Commission. They are, as a rule, portly dignified gentlemen, who have not for many years traveled on their "shape." So we earnestly hope that the only necessity they will encounter for "cracked ice" and "preserving fluid" will be that little, which St. Timothy teaches us, it is well to use for the stomach's sake. As to Mr. Growley, personally we know him not, beyond his name, which seems to indicate that God is good to him, but from his enterprise and push we are inclined to believe that he must be a lineal descendant from that good old Irish paragon, of whom Florence, the comedian, used to sing to us, so many years ago: "Begorra! Mister Growley, you're a d—d foine man."

HEPATIC DISEASE IN PREGNANCY.

ONE of the most interesting recent developments in that practically universal specialty of obstetrics is the recognition of the fact that pregnancy seems to throw a special strain on the liver, which is not always well borne. It has been the custom to talk overmuch of kidney affections in the course of pregnancy. Some of these have been supposed to be merely functional, due to the extra work thrown upon the kidneys of performing the excretory function for two beings, especially under the unfavorable conditions of increased intra-abdominal pressure with consequent disturbance of circulation. These affections were thought to be completely recovered from, in most cases, and the significance of albumin during pregnancy has been one of the disputed points in urinary diseases. It has been recognized that if true kidney disease existed before pregnancy began there was serious danger of an exacerbation of the affection, with resultant damage to the organs and often a fatal result. In general, however, too much emphasis has been thrown upon renal disorder as the basis of many pathological conditions during pregnancy, for which no other adequate cause was apparent. It has been easy to make the kidney responsible and thus medical ignorance has been cloaked and unfortunately medical curiosity satisfied by expressions such as "the kidney of pregnancy," "renal congestion in pregnancy," and the like, where no direct connection between these conditions and the kidneys was traceable.

As the result of recent investigations the liver is to be made to share its burden of responsibility for serious health disturbances during pregnancy. The recognition twenty-five years ago of acute yellow atrophy of the liver as an accompaniment of pregnancy and the study of this disease threw some light on an important subject, but, unfortunately, it was concluded that this condition was very rare and therefore need not be much considered. In its extreme form there is no doubt that it is rare. In milder forms, however, it is probable that it exists much more frequently than has been thought and recent autopsies, both in Europe and America, show that certain cases of eclampsia, as well as cases of pernicious vomiting, which have proved fatal, exhibit degenerations of the liver substance not unlike the pathological changes in acute yellow atrophy.

The pathological picture which is nearest that of acute yellow atrophy is found in phosphorus poisoning. It is well known that this is due to the absorption of phosphorus into the circulation and its direct transportation through the portal system to the liver where it produces extensive fatty degeneration. If this fatty degeneration has continued for some days, there is an absorption of fatty material with a lessening of the size of the liver and the picture then resembles very closely that characteristic of acute yellow atrophy. Whether there is some extremely irritant substance absorbed from the digestive tract in the course of certain pregnancies which produces this tendency to fatty degeneration in the liver remains to be proved. It would seem, however, that the digestive tract must be held primarily responsible. The fact that pernicious vomiting should be one of the clinical manifestations of this hitherto unassociated group of affections appears to confirm the suspicion of digestive disturbance and the absorption of toxic substances from the digestive tract as a principal element in the etiology of these conditions.

It would not be strange if the carrying of certain of these intensely toxic substances to the kidneys should produce at least a functional derangement of their secretion. Phosphorus has almost as severe an action on the kidney as it has upon the liver. Even though the irritation were milder than that produced by phosphorus, the presence of albumin in the urine, of a certain amount of blood and of casts covered with cellular detritus would be within the boundaries of rational anticipation. It has been well recognized for some time that no dependence could be placed on any indications of the approaching development of eclampsia that might be derived from the amount of albumin in the urine. In fact, the whole etiology of eclampsia, notwithstanding all the work that has been devoted to it, has remained shrouded in obscurity. It is to be hoped that the present line of investigation will prove more fruitful of lasting results than have previous studies. It is extremely suggestive to find that a number of conditions in pregnancy, hitherto thought to be quite unrelated, are perhaps due to modifications of the same set of pathological changes and that all of them are associated with digestive disturbances rather than with intractable organic lesions.

THE URINARY DISTURBANCES IN LOCOMOTOR ATAXIA.

THE victims of tabes dorsalis are frequently subject to bladder disturbances; these commence and evolute silently and the ultimate outcome is distention of the bladder. This subject has been ably discussed in a paper by Desoros, read at the Société de Thérapeutique de Paris, February 24, 1904.

An early diagnosis is of the greatest necessity in these cases. The first symptom is a peculiar *hesitation* at the commencement of micturition. It is a kind of timidity of the bladder, a urinary stuttering, which begins by the passage of a few drops of urine, then ceases, and afterward begins again. The jet may retain its full strength for a considerable time, but at last the urine falls vertically to the ground, drop by drop.

Beside these common symptoms, two others of much greater diagnostic weight enter upon the scene; (1) sudden arrest of the flow without giving rise to any pain to the patient or to that sensation of contact so readily perceived in cases of calculous obstruction; (2) the impossibility to expel the urine, which effort is followed by an involuntary evacuation. The patient cannot micturate when he desires and he voids urine when he does not wish, and he is surprised to find his clothes suddenly wet.

Sensory phenomena then follow. Shooting pain in the region of the bladder, extending down the penis or urethra, is not uncommon, but attacks of cystalgia and vesical neuralgia of great intensity occur, being increased by micturition, which in its turn is made more frequent from these attacks.

In other cases, which are the most usual, the patient complains of a vague sensation, with frequent and impeded micturition and finally pain. All this is simply the ordinary clinical picture of an irritable bladder, which is met with in the beginning of tuberculous cystitis just as in ataxia.

Incontinence of urine is the symptom which most forcibly attracts the patient's attention and is due to irritability of the bladder; it should be considered as a false incontinence because it is produced by frequent and imperious desire to empty the bladder. The patient is unexpectedly seized and not having the time to control himself, the act is accomplished in his clothes.

In other cases the incontinence is caused by a paralysis of the sphincter, and, as has been pointed out, it may follow fruitless efforts at micturition. In the majority of cases, however, there is another cause, namely, incontinence by retention, and patients may very rapidly reach this stage.

To make a diagnosis, one should take locomotor ataxia into consideration in the first place, for it is quite frequent to see the urinary apparatus attacked the first of all, and it may present the only symptoms for some time. A general examination of the patient will give one the key to the situation and, as far as local examination goes, palpation of the hypogastrium and digital exploration of the rectum will suffice, which allows one to appreciate the condition of the prostate and to map out the distention of the bladder. The catheter should only be used as a last resort, because the bladder in ataxia is far more readily infected than a normal one.

The urinary disturbances of tabes are usually mistaken for those set up by urethral stricture or hypertrophy of the prostate, as well as cystitis and infections of the bladder. The condition of the urine, the use of the bougie à boule, which shows the condition of the urethra without entering the prostatic portion or the bladder, the advanced age of prostatic subjects, the increase of the symptoms at night, etc., will settle all doubt as to the nature of the affection as far as the prostate is concerned.

A mercurial treatment should be begun at the same time as the local treatment. The latter has two indications to fulfill, namely to prevent retention from taking place at the commencement and at a later date to prevent ascending lesions. If the bladder empties itself the catheter should not be employed, but when this is not the case the urine should be drawn off at regular intervals and asepsis must be absolutely perfect, especially when the bladder is distended and presents a soil in every way prepared for infection. The urine should be drawn slowly, as when dealing with prostatic enlargement, because this is the best way of preventing the occurrence of severe hemorrhage, which might otherwise arise.

If the bladder is primarily infected, or should it become so, a few irrigations with one of the ordinary antiseptics are indicated, but, above all, one must be sure to empty the bladder first.

When the treatment is well conducted, not only will the retention diminish, but the bladder is quite susceptible of regaining a certain degree of contractility. Intravesical electrization is of little value and is very prone to produce a hyperemia of the bladder walls, a condition that should always be avoided.

ECHOES AND NEWS.

NEW YORK.

Dr. Cabot's Appointment.—Dr. Follen Cabot, Jr., has been appointed Visiting Surgeon to the City (Charity) Hospital, New York. He will assume the duties of his position in the near future.

Typhoid Situation.—The Department of Health reports 146 cases of typhoid fever for the week ending September 10, with 21 resulting deaths.

Inspector of Contagious Diseases in the Bronx.—Commissioner Darlington has announced the creation of the office of Chief Inspector of Contagious Diseases in the Bronx, which will be filled by Dr. Charles F. Spencer, of 1124 Tinton Avenue. The Commissioner said that on account of the rapid increase of population above the Harlem the work had increased so that the present Sanitary Inspector was unable to keep up with it. The new office will be at the headquarters of the Health Department, One Hundred and Sixty-eighth Street and Franklin Avenue.

War on Trachoma.—With the opening of the public schools the Department of Health will renew its active struggle against trachoma. Inspectors will visit every building and every room as soon as possible after the regular work begins, and the eyes of every child will be examined for traces of the disease, which is gradually beginning to give way under the continued assaults of the department. Children suffering from trachoma will be kept from school until they have undergone an operation or had appropriate treatment. The department will perform the necessary operation and administer treatment without charge. A certificate from any reputable physician that a child has begun treatment will obtain readmission. The school children who are to undergo operation will have to wait their turn at the new trachoma hospital the department has opened at West One Hundred and Sixteenth Street and Pleasant Avenue. From five to six operations a day is the capacity of the hospital. Treatment will be given at this place and at a small building on the grounds of Gouverneur Hospital, on the East Side. It is believed that this inspection will show a great falling off in the number of trachoma cases. After the

schools are well settled and the trachoma examination completed, it is proposed to test the eyes of the school children for defective vision.

The Physical Test.—Grand Chief Warren S. Stone, of the National Brotherhood of Locomotive Engineers, has not let one thing be forgotten. Recently he was quoted as saying: "There was some talk, too, over the physical examinations the men don't like. We object to the present system, the standard railway test, and want the practical test—that is, we want men to be subjected on a railroad to the test of color. Let a man be taken out in the open and asked to test colors and semaphores. Men can do that and stand the test who couldn't arrange a skein of sixteen bits of yarn from light to dark. But that will be fixed up by the arrangement in the future. The "standard railway test" to find out whether a man is color blind was designed by expert oculists as the safest and surest method of getting at the truth about a man's eyesight. It is a hard and rigid examination, but it is no harder, no more rigid, than the importance of the subject demands. It is practically impossible for a person afflicted with color blindness to pass it. And in this lies its virtue. The "practical test" which Mr. Stone advocates is one that might possibly be passed by an unscrupulous person conscious of his inability to distinguish colors and shades. This is the weakness of the "practical test." Upon the ability of the motormen to distinguish promptly the signals set for their guidance depend the safety and the lives of the passengers.

Carbolic Acid Sale Stopped.—At the conclusion of the regular meeting of the Board of Health September 8, Commissioner Darlington announced that the following amendment had been made to the Sanitary Code: "No phenol, commonly known as carbolic acid, shall be sold at retail by any person in the City of New York, except on a prescription of physician, when in a stronger solution than 5 per cent." The action of the Board of Health in adopting an ordinance to check the sale of carbolic acid cannot be called timely. Such an ordinance should have been put in force years ago, when the ease with which would-be suicides could obtain the poison now proscribed was first pointed out in the newspapers. Tardiness of adoption, however, has not destroyed the wisdom in the law, and enforcement should be earnest and unremitting. Death by the carbolic acid method is painful beyond ready description. But this fact has usually made its appeal too late. Desperation has driven its victims to the cheapest and most available means of self-destruction, and it has come to pass that nearly half the suicides in New York City are accomplished by the deadly phenol. The carbolic acid route out of the world has particularly attracted women and girls. There is reason to believe this law will do more than drive the despairing to other means of self-killing. It will cause in many a case such delay in the execution of an ill-judged determination as will bring a sane and saving second thought to the fore.

Fixing the Blame.—Apropos of the epidemic of typhoid fever now raging in the Bronx most lay, and not a few medical, journals have found material for interesting though not always thoroughly understandable editorials. The old saw about an ill wind, etc., is doubtless true enough, but usually the wind is traveling at a hurricane rate in some quarter or other unchecked by physical laws that are ordinarily in operation. A typhoid epidemic may stimulate thought and engender the expression of more or less valuable opinion, but it is unfortunately a big price to pay for the senseless mouthings of those who are entirely ignorant of the circumstances attendant upon its origin and propagation. Probably no city approaching even one-half the size of New York, has a health board composed of men so well trained for their work or so conscientious in having that work carried out, and while the Board has not been openly condemned, disparaging remarks have been made. New York is a difficult city to manage because of its distinctly cosmopolitan type—education in matters sanitary must always be nearly a hopeless task when one has to deal with semi-barbarous illiterates from the mountains of Italy and other countries of the Old World, and no end of rules and regulations can rid them of filthy habits acquired through long years of groveling existence on their native soil. Some daily journals have even gone so far as to calculate the money cost of the scourge and have compared these figures with the astonishingly small cost of prophylaxis, assuming to know, of course, just how much in dollars and cents it really does cost to keep a colony of Italians *in statu quo*. It is a great mistake to suppose that because we have fire companies there ought to be no fires, and because we have police patrol there ought to be no night brawls, and because we attempt to prevent disease no disease should exist. In spite of all precautions we are likely to have a severe outbreak of some disease or other at any time.

PHILADELPHIA.

Woman's Medical College.—This college is to have its own hospital for teaching purposes instead of using the Woman's Hospital which adjoins the institution. The separation has grown out of the refusal of the hospital to accept as one of its staff a youthful professor appointed last year by the college.

Texas Cattle Fever in Pennsylvania.—An outbreak of this fever has recently occurred among the cattle in the vicinity of Lancaster. The disease was brought from the south and spread by a car of cattle not labeled as coming from the infected district. State officials have the disease in check.

Home Study Hours Lessened.—The public school studies have undergone a revision lasting more than a year, and this is now complete with the exception of physiology which is soon to be added to the list. One of the main objects of the revision was to lessen the amount of home study required, this having become a serious complaint of the parents.

To Honor Dr. Chapin.—It is proposed to give Dr. John B. Chapin, Superintendent of the Pennsylvania Hospital for the Insane, Philadelphia, a dinner in October next, in honor of his half-century's work in behalf of the insane. Those desiring to participate in the function should correspond with Dr. Edward N. Brush, Superintendent of The Sheppard and Enoch Pratt Hospital, Towson, Md.

CHICAGO.

Opening of Swedish Hospital.—The new Washington Park Swedish Hospital, at Sixtieth Street and Vincennes Avenue, was recently dedicated, the dedicatory exercises being under the auspices of the Sophia Aid Society. Ten patients already are in the hospital. The building was completed August 25. The institution has accommodations for fifty patients. The founders believe the institution will grow rapidly. Dr. O. C. Young is the head physician. The staff is composed of Drs. John B. Murphy, Frank Billings, Archibald Church, William A. Evans and A. Hakanson. The operating room is equipped with all modern appliances.

Nervousness in School Children.—According to Dr. C. C. Krauskopf, assistant supervisor of the child study department of public schools of this city, it is estimated that one in every three of the school children is a victim of some form of nervousness. This is the finding of public school pedagogues after observations extending more than a year. The prevalence of nervous disorders among children is attributed to strenuous city life; impure city atmosphere; the bringing up of children in flat buildings; no relief from noise, day or night; lack of proper nutrition; late hours permitted by parents, and residence along cable and trolley car lines. The finding is based on statistics collected in every part of the city. Of the three hundred pupils examined by the child study department of the school board during the last year, a large majority of the defectives were found to be sufferers from nervous affections. The nervous affections usually took one of two forms: Sluggishness and mental depression, with tendencies toward melancholia, or uncontrollable nervous twitchings. In a great many of the cases nervousness is directly traceable to lack of proper food, accompanied by poor air to breathe, life in flat buildings, noise day and night, etc. It has become a recognized fact that everything possible must be done in the public schools to counteract the nervous effect of city life. A public school principal, who has made a careful investigation of the subject and intends to publish a monograph showing the effect of city life on the child, declared that parents have no conception of the appalling increase of nervous complaints among children.

Teachers in Good Physical Condition.—Of the 171 teachers examined by the child study department during the last vacation period, only six failed to pass the physical examination.

Donation for St. Luke's Hospital.—According to the will of the late Mrs. J. H. McVicker, $10,000 will be donated to this institution.

Mortality for the Week Ended September 3.—According to the Bulletin of the Health Department, for the week ended September 3, there were reported 491 deaths; 19 more than in the previous week, making an annual mortality rate of 13.27 per 1,000. Violence caused 69 deaths; acute intestinal diseases. 86; consumption, 61; and heart diseases, 32.

GENERAL.

Georgia Tuberculosis Commission.—Governor J. M. Terrell, of Georgia, has appointed a medical commission to investigate the extent of tuberculosis in Georgia and means of stamping out the disease. This is the first commission of the sort instituted in the South, and was created by an act of the General Assembly approved in August. The commission will cooperate with the State board of health and doubtless, also, with a committee on tuberculosis appointed some time ago by the State Medical Association. Dr. Charles Hicks, of Dublin, is chairman.

The Auto or the Horse—Is Either Safe?—Dr. F. W. Dalrymple, a prominent physician of New Rochelle, N. Y., was thrown from his buggy in a runaway accident and had his collarbone broken and head badly bruised.

Dr. Russel G. Andrew, Jr., a Coroner of Monmouth County, and a practising physician at Highlands, N. J., was seriously, if not fatally, injured on the same date, while returning from a visit to a patient at Sandy Hook. A private motor car, in which Dr. Andrew was riding at the rate of twenty-five miles an hour, jumped the rails opposite The Cedars on Sandy Hook. Dr. Andrew was thrown with terrific force to the ground. He was taken unconscious to his home an hour later, where his father, Dr. R. G. Andrew, Sr., a physician of Navesink, was summoned. Dr. Andrew found that his son had sustained a compound fracture of the right leg, was suffering from severe bruises on the head and hips, and probable internal injuries.

Chill Room Cure for Lockjaw.—A ten-year-old boy is battling for his life against a severe attack of tetanus in the big chill room of the Jetter brewery in South Omaha, Neb. When convulsions came on and the boy's condition grew worse the parents were prevailed upon to permit the boy to be taken to the chill room in the brewery. His condition improved immediately, but he objected to lying in the chill room and was taken back to his home. There the convulsions returned and the boy was taken back to the chill room. Within one hour after he was taken there the severity of the convulsions had been greatly reduced and the patient was able to straighten out his legs. Two days later the convulsions disappeared entirely and the boy was able to open his mouth and take nourishment. The physicians say that he will recover and that the new chill-room treatment will have saved his life.

The Cocaine Danger.—Not wholly a subject for cheerfulness are certain figures, just published in Brussels, which show an enormous increase in the output of coca leaves and in the manufacture therefrom of the alkaloid called cocaine. The raw material comes from Peru, and exports of it from that country have more than doubled since 1899. Last year they amounted to something like 1,300,000 pounds, the bulk of the product being gathered by Indians from the wild plants in the forests. Cocaine, of course, is of great usefulness in medicine, but it is being dangerously misused. Many makers of patent medicines are utilizing it on a large scale. It enters into the composition of numerous catarrh remedies, and is the active ingredient of a variety of nostrums which deaden pain by the simple process of reducing the sensibility of the nerves. The relief it gives in cases of irritation of the nasal passages is due to its property of contracting the smaller blood-vessels in the mucous membrane. People take these medicines without knowing that they contain cocaine, are relieved by them temporarily, and acquire a habit for the drug, which is quite as bad as morphine, being not less destructive to the nervous system. It is an excellent illustration of the fact that proprietary remedies which contain powerful toxic agents ought to be labeled with a suitable warning, under compulsion by the law. This is done in European countries, and any evasion of the regulation is punished with severe penalties.

When Vacation is Over.—In many of the cases where a family return home from their long summer outing apparently in the best of health, only to succumb to illness soon after, the family doctor lays all the blame on the water or sanitary conditions of the summer home, and sometimes quite unjustly. says a writer in *Harper's Bazaar*. Undoubtedly many country places are most unsanitary, but often it is the town house which is responsible for the low fevers and so-called "malaria" that attack us in the autumn. Where it is a possible thing no housewife should think of moving her family into winter quarters until the house has been aired at least a week. No water should be used from the taps (except for washing) until it has been allowed to run a couple of hours and the pipes are thoroughly cleared of the summer accumulations. It is also an excellent precaution to pour boiling water mixed with chloride of lime down each escape pipe and all toilet closets. The proportion of the mixture should be a heaping teaspoonful of lime to a quart of boiling water. The empty and long disused icebox or refrigerator should come in for a most thorough overhauling before

a particle of food is put into it. If the shelves are movable, as they should be, take them out and boil them thoroughly in the clothes boiler. Wash out all the inside of the box with as hot water as can be handled. Be especially careful to see that the little pipe at the bottom, which takes away the water from the melting ice, is absolutely clean and sweet. In our rather damp climate beds which have been unused for some time should be most carefully looked after, dried, and aired thoroughly before being again occupied. The cellar should come in for careful inspection, and be given all the air its small windows will allow. If it has a close, mouldy smell on being first opened a coat of whitewash will be found an excellent and inexpensive disinfectant.

Radium Rays and Diphtheria.—Considerable attention has been drawn to the therapeutic effects of radium and naturally much interest attaches to experiments in this field. The claim has been made that exposure for forty-eight hours to radium rays would prove fatal to typhoid-fever bacilli when placed close to the source of rays, while anthrax spores and lower organisms of various kinds have similarly been destroyed. Recently a series of careful experiments, made at the biological laboratories of the Massachusetts Institute of Technology, by Professor S. C. Prescott, seem to show that exposures of less than ninety minutes to radium rays have no destructive effect in the case of the intestinal bacillus (*Bacillus coli*) and the bacillus of diphtheria (*Bacillus diphtheriæ*), and also in the case of the bacteria of domesticated yeast (*Saccharomyces cerevisiæ*). The importance of these experiments is that they were performed with three varieties of bacteria essentially different, and the time conditions were such as would be encountered in using practically the radium rays as a germicide. Naturally the experiments with the diphtheria bacillus are of the greatest general interest, as it has been asserted that radium enclosed in a certain form of capsule and inserted in the throat of the patient would effectively destroy the organisms of the disease, and it has been suggested that for the cure of diphtheria radium might prove as effective as antitoxin. In these experiments no evidence was obtained which would indicate any possibility of the successful treating of diphtheria by destroying with the rays from radium the specific micro-organisms of the disease, and Dr. Prescott states as a conclusion that the use of radium tubes for this purpose cannot be recommended, nor can they be regarded as a substitute for antitoxin. Furthermore. he believes that where any benefits have been obtained from the therapeutic use of radium, the effect is not due to the destruction or weakening of the pathogenic bacteria, or disease-bearing micro-organisms, and that a further explanation must be sought. The subject continues to be of interest and an open question. as both positive and negative results have been obtained from the use of radium by physicians; but later reports do not seem to indicate any marked success or advances, while such experiments as those described above seem almost conclusive.

Tuberculosis Open-Air Treatment.—The new open-air treatment for consumptives, by which the patients remain night and day, awake or asleep, in a bath of pure atmosphere, is attracting much attention. Whether the weather is warm or cold, they are exposed as much as possible, being protected only from drafts. If it rains or snows they are not shut in, but are merely sheltered against the wet. Thus they have at all times a maximum supply of oxygen, which is hostile to germ life, while kept safe from further infection and supplied with plenty of nourishing food. The Federal medical authorities have become much interested in the enterprise, and Dr. George M. Sternberg, recently Surgeon-General of the Army, is urging the establishment of open-air hospitals on a considerable scale. Treatment will be restricted to those who are too poor to compass any means for their own relief, and whose removal from their ordinary surroundings will be to the interest of the community at large, in view of the infectiousness of the disease from which they suffer. The method adopted is to build a number of outdoor shelters, each one to accommodate only two patients, with an administrative headquarters for the physicians in charge. Of course, the plan as yet is in only an experimental stage, but if it proves as successful as is indicated by what has already been achieved, such open-air camps will doubtless be established on an extensive scale. Municipalities, for their own protection, can well afford to maintain them, the cost being by no means great. It is estimated, in the *Saturday Evening Post*, that nearly ten per cent. of all diseases that carry off human beings before, in the ordinary course of nature, they would die are caused by tuberculosis, which in this country destroys 160,000 lives annually. Nevertheless. it is entirely preventable by the adoption of a few simple measures of precaution. Consumption would largely disappear within twenty years if people would refrain from spitting in public or other places where their sputum may dry and be carried about in the air, together with any bacilli it happens to contain. By the adoption of sanitary measures the mortality from tuberculosis in France has been reduced within twenty years to forty per cent. In Germany it has been lowered in the same way by an equal percentage. Adequate statistics for this country are not obtainable, but in New York City since 1881 there has been a reduction of forty per cent. in deaths from consumption. The problem of getting rid of this frightful plague can be solved only by educating the people and by the rigid enforcement of regulations against promiscuous expectoration.

Ramsay's Latest Researches.—At the dinner of the chemists on September 8, Sir William Ramsay indulged in a prophetic remark which naturally arrests attention. He suggested the possibility that a discovery was imminent which would throw light on the origin of the "ordinary element." These may be, he intimated, "the products of the breaking down of radio-active elements of high atomic weight"—radium, uranium, thorium and one or two others. The hope to which he thus gave expression was doubtless based on recent but unfinished investigations, briefly described by him in a letter to *Nature* a few weeks ago. There is a general disposition now to explain the strange phenomena which characterize the behavior of radium—among them the evolution of a gas that slowly turns into helium—by assuming that some of the atoms of the first mentioned element disintegrate, and in so doing liberate stored energy. Sir William asked himself if it were not practicable to reverse the process and build up an element by a proper combination of material and energy. The latter would be required in a concentrated form, but a supply could apparently be secured by the breaking down of a radio-active substance. The task which is here outlined possesses great difficulties. Every working chemist knows how much easier it is to ascertain of what elements a compound is composed than to make them unite. Synthesis is very much harder to effect than analysis. Still, it has been possible in the laboratory to imitate nature's example in the production of indigo, camphor and

several other articles of commerce. In like manner the preliminary work already done by Sir William has encouraged him to think that perhaps one kind of atom can be transformed into another by a process of building up.

The Doctor's Income of the Future.—Doctors who believe—and apparently there are many of them—that the members of their profession are different from and superior to the members of all others, in that they are constantly endeavoring to put an end to the thing out of which they live, really ought to view their own mental condition with apprehension. The *Times* suggests that they "take something" for it before this queer delusion lets in a lot more and the unhappy victims pass beyond the possibility of help, even from such of their brethren as remain sane. Latest of many manifestations of the belief that the doctors, from a business point of view, are nobly cutting their own throats, is one that appears in the *Post-Graduate*. "It is not generally realized," says that high authority, "that the medical profession is the only one laboring conscientiously and faithfully to destroy its own source of income. Every improvement in hygiene and in sanitary science, every discovery of a specific source of disease, by improving the general health removes large amounts of money from the medical man's pocket and adds incalculably to the wealth of the community. The time will come when this fact will be generally realized." Possibly. But about the same time, there will be a realization, that the labor, conscientious and faithful as it is, and measurably successful as it has been, besides, is not destroying, or even tending to destroy, the source of the doctor's income. For the task imposed upon them is one that, if not quite endless, theoretically, most certainly will not be completed by this generation of doctors or by any generation of their successors in whom they can pretend to have a personal interest. One can conceive, of course, of a time when medical and surgical science shall have made such progress that everybody will live on indefinitely in a state of perfect health, and there will be nothing more for doctors to do, but an enormous "meanwhile" will precede that glorious age, and while it lasts the doctors are in no danger of starving.

International Congress of Dermatologists.—Upon the invitation of Dr. Hyde, of Chicago, Dr. Stelwagon, of Philadelphia, Dr. Fordyce, of New York, and Dr. Gilchrist, of Baltimore, the American delegates to the International Dermatological Congress, which was in session in Berlin during the present week, it was decided to hold the next Convention in New York. The venerable Professor James C. White, of Boston, was elected president of the forthcoming congress.

OBITUARY.

Dr. A. W. BUTLER, aged twenty-four years, died suddenly September 6, at the home of his parents in East Nashville, Tenn. Dr. Butler graduated in 1903 from the medical department of the University of Tennessee, taking high honors and winning an interneship at the City Hospital. Excessive application to work, both during student life and while in the hospital, contributed to his untimely death.

Dr. EDWARD P. BUFFET, died at his home, 809 Bergen Avenue, Jersey City, N. J., September 10. He was born at Smithtown, Long Island, on November 7, 1833. He was graduated from Yale in 1854, and from the New York College of Surgeons in 1857. He had practised in Jersey City from that time.

SOCIETY PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION.

Seventy-second Annual Meeting, held at Oxford, England, July 26, 27, 28 and 29, 1904.

(Continued from Page 528.)

SECTION ON STATE MEDICINE.

Control of Milk Supply.—A lengthy discussion on this subject was held. Dr. George Newman opened the conference. He said: A right understanding of the best methods of how most effectually to control and protect the milk supply depends upon a clear appreciation of the exact reasons and conditions which make control necessary. It is because the public, and perhaps even the profession, do not understand the latter as fully as they might that they do not appreciate the importance of the former or perceive the lines on which it should proceed. For convenience, the reasons necessitating control of milk may be broadly divided into two: First, there is the prevention of milk-borne disease; and secondly, there is the improvement and increase of the milk supply.

Typhoid Milk.—It was Dr. Michael Taylor of Penrith, who in this country first demonstrated the conveyance of typhoid fever by means of milk. This was in 1857. Since that date more than 160 epidemics of this disease have been traced to a polluted milk supply. Schuder states that 17 per cent. of all typhoid epidemics are due to the consumption of infected milk. The steps in the process of infection are briefly as follows: Enteric fever affects the intestine, and hence the excreta, especially in the early stages of the disease, are charged with large numbers of the casual bacilli. It is now known that the sweat, expectoration from the lungs, and the urine of a typhoid patient may also contain the typhoid bacillus. Indeed the urine in 25 per cent. of the cases generally contains large numbers of the bacillus (Horton Smith). There is also evidence to show that the bacilli may remain in the urine for long periods after convalescence, even for months and possibly for years. The bowel discharges and the urine are, therefore, the two chief channels by which the typhoid bacillus is excreted. It, therefore, readily gains access to the soil, to drains, and eventually on occasion to the water supply, and thus into milk and back again to man. The virus does not always pass in the discharges to water and milk, but may reach them by becoming dried dust. A small pollution may in this way set up widespread disease. The most common way for milk to become infected by the typhoid bacillus is through infected water (in 29 per cent. of milk-borne outbreaks according to Schuder). Another source of infection of the milk is when persons suffering from a mild attack of typhoid fever continue to work a dairy or otherwise deal with milk, and this has proved a frequent means of infection. Flies doubtless convey the germ of the disease not infrequently, as was shown in the Spanish-American war of 1898 and the Boer war of 1900-1. Though the typhoid bacillus appears not to have the power of rapid multiplication in milk it has the faculty of existing in milk for a considerable time (twenty days or longer) even when milk has curdled or soured, and may thus infect milk products, such as butter and cheese. But infection by milk products may be eliminated as of too rare occurrence to deserve attention. The bacillus does not coagulate milk like its ally the *Bacillus coli communis*

(which is a frequent inhabitant of milk). It flourishes in milk at room temperature and blood-heat, and does not produce acid or alter the appearance of the milk. The common channels of typhoid infection of milk, as illustrated in epidemics are as follows: (*a*) Personal contact with typhoid patients; (*b*) infection from washing milk vessels with infected water; (*c*) infection by the addition of infected water directly to milk; (*d*) infection from the air by dried typhoid excreta; (*e*) infection from contaminated cloths or clothes; (*f*) infection derived from water in which milk in vessels was being cooled.

Scarlet Fever and Milk.—The second infectious disease shown in this country to be transmissible by milk is scarlet fever. In 1867 Dr. Michael Taylor investigated such a scarlet fever ontbreak at Penrith. Since that date some seventy milk-borne epidemics of scarlet fever have been put on record. It is unnecessary here to do more than mention two broad series of facts which should not be forgotten in investigating milk-borne scarlet fever outbreaks, or in endeavoring to prevent them. First, while in similarly-conveyed outbreaks of typhoid fever it is necessary to consider the various ways in which human infection has been conveyed to milk, in scarlet fever it is necessary to consider in addition the possibility of cow infection. Human infection in scarlet fever outbreaks is almost always conveyed by direct cnotact, and not, as in typhoid, through the medium of water or materials. Since 1881 there has been necessary the added inquiry as to the communicability of zymotic disease from the cow. The case of cow infection of scarlet fever is not yet proved or established. But there is certainly not a little evidence to show that previously to some scarlet fever outbreaks, and outbreaks of aberrant forms of disease to be mentioned immediately, certain pathological conditions of the cow's udder have been found to be present; and it may be that further research will prove that there is causal relation between such conditions of the cow and disease in persons consuming the milk derived from such cows. Certainly there is sufficient evidence to make necessary careful axamination of the cow in all milk-borne outbreaks of disease. The second point to which attention must be called is the clinical modification of scarlet fever which has been milk-borne. Such disease is generally mild, and accompanied by a large number of ordinary sore throats. Even in the scarlatinal cases the disease has a tendency to remain localized to the throat. The rash is evanescent, and the desquamation scanty. There is commonly a marked absence of post-scarlatinal nephritis, and a marked presence of alimentary disturbances, sometimes amounting to intoxication.

Diphtheria and Milk.—In 1878 evidence was first forthcoming in support of the view that diphtheria might on occasion be spread by milk. In that year Mr. W. H. Power made an inquiry into the outbreak of diphtheria in North London, and although it was clearly shown that milk was the channel of infection it was not discovered how the milk became infected. By a process of exclusion Mr. Power suggested that there may have been risk of specific fouling of milk by particular cows suffering, whether recognized or not, from specific disease. Subsequently to the discovery of the Klebs-Löffler bacillus, Klein investigated the question of cow diphtheria, and Dean and Todd have recently thrown further light on the subject. There can be little doubt that milk is a favorable medium for the *Bacillus diphtheriæ*. The organism both lives and multiplies in ordinary sterilized milk, but it thrives better in milk at comparatively lower temperatures than 37° C. In ordinary milk, unsterilized and unprepared, the commoner organisms multiply much more rapidly, and so the diphtheria bacillus is in all probability soon crowded out. The cases, however, in which the *Bacillus diphtheriæ* has been actually isolated from milk are extremely few. He further spoke of sore throat and epidemic diarrhea both as being conveyed by milk and presented a lengthy argument concerning the conveyance of tuberculosis by this medium. Improvement of the milk supply, the conditions of the milk trade, and the quality of milk were other topics taken up by Dr. Newman. He very generously accorded to this country a just commendation for the excellent work done on the milk supplies of our large cities and seemed to think that England was behind in her study of the problems of pure milk supplies.

Hygiene in Elementary Schools.—Dr. W. N. Barlow spoke of the needs of teaching simple hygienic subjects in the elementary schools. Nearly every medical officer of health, he said, in his annual report, deplores year by year the immense wastage of infant life, and comments upon the causes contributing thereto. It has been pointed out that, while some amount is due to neglect and indifference, very much more is due to ignorance. Hundreds of lives are lost yearly through ignorance of how to feed children. Hundreds of lives are lost yearly through ignorance of the simple laws of health. A man with a prize dog will take immense pains to learn how to feed the animal and keep it in health, but will take no pains to see that his baby is properly fed and clothed, or how to keep himself healthy. Many hundreds of infants' lives are lost by reason of clinging to old superstitions regarding measles and whooping-cough. They are still considered mild diseases and of no account, in spite of oft-repeated warning that they kill more than all the other what are called "dangerous infective diseases" put together. It is a common superstition in Liverpool, that if a child with whooping-cough be taken across the river when the tide is on the ebb, that the disease will ebb with it, the result often being that an attack of bronchitis follows and the child's life ebbs altogether. Efforts have been made to lift this pall of ignorance by scattering leaflets broadcast dealing with infant feeding, etc., and by popular lectures; but the fact remains that, among the poorer classes, most mothers cannot be taught; some will not be taught; and it has now come to be accepted that the best way to fight the battle is to do what is possible by means of leaflets and lectures with the present generation, and to improve the next generation by teaching a few of the elementary facts regarding personal hygiene, domestic hygiene, and the feeding of infants to the children (especially the girl children) now at school. Now many education authorities, while looking more or less favorably upon the suggestion that hygiene should be taught in public elementary schools, say, "But how can we include this subject? our curriculum is already full to overflowing, and there are already many subjects much more valuable which ought to be taught and for which there is no room." Others say, "We already teach it in the subject called domestic economy." With regard to objection No. 1, I cannot do better than take a few extracts from Herbert Spencer's Essay on Education, a most valuable book, which I would recommend to all who have not yet read it.

Spencer deplores that the useful in education is sacrificed to the ornate, especially with respect to women. He says: "In the treatment of both mind and body, the decorative element has continued to predominate in a greater degree among women than men. In their education the immense preponderance of 'Accomplishments' proves how use is subordinated to display. When we have named reading; writing; spelling; grammar; arithmetic; and sewing, we have named all the things a girl is taught with a view to their actual uses in life." Again he says: "If there requires further evidence of the rude, undeveloped character of our education, we have it in the fact that the comparative worths of different kinds of knowledge have been as yet scarcely even discussed—much less discussed in a methodic way with definite results. Not only is it that no standard of relative values has yet been agreed upon, but the existence of any such standard has not been conceived in a clear manner." Again, "For complete living it is necessary not only that sudden annihilation of life shall be warded off, but also that there shall be escaped the incapacities and the slow annihilations which unwise habits entail. As without health and energy the parental, the social, and all activities become more or less impossible, it is clear that this secondary kind of direct self-preservation is only less important than the primary kind: and that the knowledge tending to secure it should rank very high. Consider how ill-health hinders the discharge of duties, makes business often impossible and always more difficult, and produces an irritability fatal to the right management of children." "Vigorous health and its accompanying high spirits are larger elements of happiness than any other things whatever, the teaching how to maintain them is a teaching that yields in moment to no other whatever!" One last quotation: "Is it not an astounding fact, that though on the treatment of offspring depends their lives or deaths, and their moral welfare or ruin, yet not one word of instruction on the treatment of offspring is ever given to those who will by and by be parents. Is it not monstrous that the fate of a new generation should be left to the unreasoning custom, impulse, fancy, joined with the suggestions of ignorant nurses, and the prejudiced counsel of grandmothers? To tens of thousands who are killed, add hundreds of thousands who survive with feeble constitutions, and millions who grow up not so strong as they should be, and you will have some idea of the curse inflicted on the offspring by parents ignorant of the laws of life." In the face of words like these from such a man as Herbert Spencer, can it now be advanced that there is no room in the preliminary schools for instruction on hygiene.

School Diphtheria in London.—Dr. C. J. Thomas gave a paper on this subject. His conclusions were as follows: 1. Diphtheria is spread by schools to a certain and considerable degree. 2. It is spread by direct personal transmission. 3. It can be checked by swabbing and excluding children carrying diphtheria organisms. 4. These children are chiefly mild, actually suffering cases. 5. Their age is usually between five and eight years. 6. Pseudo-diphtheria organisms may safely be ignored. 7. School closure for diphtheria should be looked upon as a confession of impotence and defeat. 8. There is urgent need of greater recognition even on the part of medical practitioners of the rôle of slight cases and carriers. In many instances children sent home by the teachers have returned after seeing a doctor who has said they were not suffering from diphtheria, although their throats swarmed with diphtheria organisms. 9. All contacts with diphtheria cases should be rigorously swabbed before being allowed to mix with the general population. Disinfection of homes without this precaution is futile. 10. Much greater facilities for bacteriological examination need to be provided. 11. Could not the annual report of medical officers of health dealing with such facts as these become a means of education on these points? At least could they not be distributed to each member of the profession in the sanitary district?

Poverty and Public Health.—Dr. T. P. Whittaker spoke of the influences of alcoholic beverages and this general subject. His paper contained many interesting statistical summaries, but no large or new generalizations.

Pauperization.—Mrs. B. Bosanquet gave an interesting paper on this subject. Among other things she said that physical conditions which characterize the kind of life deplored are, generally speaking, dirt, overcrowding, insanitary houses, foul air, and insufficient or inappropriate food and clothing; to these must be added the presence or results of disease in the physical organism itself. All will agree that there is no single remedy for these various evils; each calls for its particular remedy, in devising which the whole skill of the expert is required. But it is not these particular remedies which are considered here; it is the general method of their application. The medical and sanitary experts will tell the particular remedies for drink, disease, and physical backwardness; the point to consider is how these remedies may be most effectually and universally applied. In short, the importance of a definite policy of reform should be urged. For in opening up an attack upon these evils there are two quite distinct policies between which have to be chosen. There is first the policy which assumes that one and all of these very dissimilar results are due to the same cause—namely, poverty; and which, therefore, aims at merely supplying from outside what is more obviously lacking. It assumes that the recipients are desirous and capable of living the healthier life, and are debarred from doing so by their poverty alone. This is the policy which thinks the way to reform lies through free meals and clothing, municipal housing, and other subsidies from charity or Poor-law institutions. The other policy is adopted by those who have found that these evils frequently exist where there is no poverty to account for them, and are driven, therefore, to probe more deeply for the real causes. These they find in the absence of those dispositions, faculties, and interests, which we are apt to sum up in the word "character;" and they find, moreover, that poverty itself is frequently but one among many outcomes of this lack of character. Hence they maintain that the true method of attack is to strike straight at the root of the evil, and by education and the healthy stimulation of interests, to arouse the energies and knowledge which will lead the backward into the ranks of the forward. A few typical cases may illustrate how important this question is of choosing a right way of applying remedies. Sanitary experts tell that one great cause of ill-health and vice is overcrowding and insanitation. Desiring to apply this knowledge rapidly and effectively, some authority clears an insanitary area and puts up dwellings of the most approved type. One of two things happens; either they permit the old inhabitants to take possession

of the new dwellings, in which case they are soon reduced to dirt and squalor; or—and this is what generally happens in London—the authority declines any but respectable tenants, and the old inhabitants go off to make a new slum elsewhere.

Or take an instance quoted by the chairman of the Birmingham Housing Committee in last week's *Spectator*. An owner was called upon by the Housing Committee to spend a large sum of money on two courts. He did everything that was required, yet now, six or twelve months afterwards, the tenants have made the houses almost as dirty as ever, and this is in no way due to the way in which the repairs were done." Take another instance. The children in an elementary school being badly nourished, the remedy naturally suggested is good food, and the reform-institutes meals at school. The inevitable result is that many mothers, relying upon these meals at school, reduce the number of meals at home, and the evil, instead of being reduced, is spread over an increasingly wider area. Or another: the doctors tell us that the great cause of infant mortality is insufficient or impure milk. Sterilized milk in bottles is supplied, until two difficulties are confronted—on the one hand that mothers may be tempted by it to cease to nurse their own children; on the other hand that, owing to the inevitable association between bottles and medicine, will only give it to their children so long as they are definitely ill. It really seems sometimes as if all efforts were useless. And yet the fault lies in no sense in the remedies themselves; it is the application of them which is wrong.

It is absolutely necessary that before any progress at all can be made the people themselves should be enlisted on our side, and to do this their minds must be influenced, we must get them to take an active intelligent interest. It is a far more difficult task than one of handling bricks and mortar, and food and clothing; but it is essential. If we can make them care for clean houses we can give them clean houses to live in; if we can make them take an intelligent interest in their children they will not fail to feed them: and if we can teach them something of the relation of food to the needs of growing children, they will feed them properly. It may be asked what proof I can offer that it is mainly ignorance and lack of interest which are at fault, and not poverty alone. I appeal for support mainly to the experience of intelligent workers amongst the poor, who have learned slowly but surely how uncertain the connection is between good earning and a good home. For those who find a greater security in figures I may refer to the rough test afforded by Mr. Rowntree's investigations in York. You will remember that of his 27 per cent. living in conditions of apparent poverty over 17 per cent. were in receipt of incomes which should have raised them out of it, while less than 10 per cent. had incomes insufficient for a healthy life. Even on this rough test, therefore, the great majority might have led healthy lives if they had known how and cared to. But more than this, we who have seen much of the lives of the poor know how often in cases of exceedingly small income, of real poverty, the worst forms of evil are absent. That is, the homes are clean, the children are healthy and well cared for, and the family life sober and industrious. Now, you will grant me that in those numerous cases where people live unhealthy lives through sheer ignorance or self-indulgence the only remedy is education and stimulus. To give money in such cases is simply to subsidize the public house and gambling; to give food is to set free more money for the same purpose; to feed the children at school is to check the supply of meals at home; while no one has been ingenious enough to even suggest a gift which will make lazy people clean.

It is not so immediately obvious that this policy of subsidising is useless in cases of real poverty, but it is just as certain, except under very definite conditions and in very definite cases of misfortune.

Consider with me for a moment what are the conditions which make men efficient workers, capable and strenuous. Some of us, no doubt, work from ambition and the desire to rise to the head of our profession; others from sheer love of our work. But for the vast majority of men the chief motive is the sense of responsibility for their own lives and those of their family. To all of us in some degree, to most of us in a very great degree, work is repugnant, and strenuousness is difficult; it is much easier to let ourselves go, to work little rather than much, to be slack rather than efficient. Against this natural indolence there is no spur so effective as a man's interest in the home and wife and children for whom he has made himself responsible. Here and there are men with wider interests, who do not need this spur; but this is, or may be the common birthright of all mankind, and deprived of it the majority lack either courage or strength to live strenuously. To realize what a man becomes who has cut himself adrift from these natural interests without substituting others as potent, we need only turn to the forlorn tramps and vagrants who drag out their listless lives in wandering between casual ward and common lodging-house.

It is for this reason that any movement which tends to lessen a man's responsibility for his own family life does far more to increase than to lessen poverty. It may be urged that you are only helping a man to fulfil his responsibilities, that you have no intention of undertaking them altogether; and between individuals, between friends and neighbors, this is a possible though difficult position. It is next to impossible when the movement becomes a general one, and some charitable or State institution intervenes to share the work of providing for the daily needs of the family. The people who are ready to impose upon the benevolence of a neighbor are comparatively few, but still fewer are the people who are at all reluctant to get all they possibly can from an impersonal source of charity or relief.

(To be Continued.)

WILL'S HOSPITAL OPHTHALMIC SOCIETY.

Stated Meeting, held April 11, 1904.

The President, Charles A. Oliver, M.D., in the Chair.

Diseases of Conjunctiva.—Dr. Harold S. Goldberg opened the discussion on this subject, demonstrating the conditions seen in an exhibit of macroscopical and microscopical specimens, illustrating the gross and minute changes found in various conjunctival diseases. He showed the microscopical appearances of the invaded structures in diphtheric conjunctivitis (the germ of diphtheria being, he said, quite a frequent successful invader in the conjunctival soil), and differentiated them from those which are seen after gonorrheal conjunctivitis. He believed that the streptococcus is, as a rule, responsible for the gross changes seen in the diphtheritic types of conjunctival disease. He showed the relative effects of benign and malignant tumors

upon the membrane, contrasting these in their differences. He exhibited the behavior of various granulomata, and gave a résumé of the condition of the conjunctival structure in a case of perforating panophthalmitis as one of the results of endogenous infection from typhoid bacilli. He said that there was little known of the difference in the histology between diphtheritic and pseudomembranous conjunctivitis; the Klebs-Löffler and xerosis bacilli being so much alike morphologically as to make their differentiation difficult. He dealt at some length as to the relative actions of the various antitoxins. He spoke of the epidemics of conjunctival disease to which the hospital had been subjected, and cited the different modes of treatment by which the condition had been successfully combatted. He had found that the recent epidemics of conjunctival diseases in this city (Philadelphia), could be traced to the diplococcus lanceolatus. He compared these findings with those which he had read of as having been seen in other cities and countries.

From a large experience Dr. Frank Fisher had found that by a constant repetition of similar cases he had been enabled to differentiate clinical signs which he had learned to treat and manage by definite and well gauged rules: One of these had been the free use of saturated solutions of chlorate of potassium in diphtheritic and so-called pseudomembranous conjunctivitis. He had found that if this drug is used in such cases there is less danger of corneal involvement, and that there are fewer cicatrices left in the conjunctival membrane. In association with the drug, in combination with warm applications and the use of mild detergents locally, he made free internal use of the tincture of the chloride of iron. He stated that he had found that the application of nascent silver salts was not of any benefit in cases of diphtheric conjunctivitis. He had noticed that the cicatrices following diphtheria of the conjunctiva resembled a condition of cirrhosis. He classified pseudomembranous conjunctivitis and diphtheric conjunctivitis together. He always treated diphtheria of the conjunctiva systematically as well as locally. He believed trachoma to be nothing more than the excessive stages of ordinary follicular conjunctivitis: trachoma being a second or tertiary stage of true granular conjunctivitis —a condition in itself in which there is more or less atrophy of the follicles. In these cases, there are, he believed, all of the sequelae of repeated inflammation, such as contraction and distortion of the lid, nebular pannus, and dry, hardened or greasy remains of the conjunctival membrane. In true trachoma he took care to express all of the follicles in the conjunctival sulcus, preferably by the finger nails, following this procedure by the use of tannin, boroglyceride, and silver. He believed that dilation of the lacrimal canals and ducts was useful in offering better drainage for the vitiated secretions. Empirically, he had become favorably impressed with the results that he had obtained by the judicious use of alum in the late stages of gonorrheal conjunctivitis. He also usefully employed solutions of acetate of zinc, chloride of zinc, biborate of soda, and boracic acid. Adrenalin he had used, but did not find its employment of any advantage.

Dr. S. Lewis Ziegler's experience in acute conjunctivitis had been that the more simple and the less irritating the application had been, the more quickly good results were obtained. As a rule, he employed four of five grain strength solutions of silver nitrate for the first application only, followed by such drugs as glycerole of tannin, boroglyceride and argyrol. These should be used ad seriatim, as all local applications sooner or later lose their effects and must be changed. He had found the best results from the employment of biborate of soda and boric acid in simple solutions. If the muco-pus persists alum, one to four grains to the ounce, will be most efficient. (The acetate of zinc is of value when the convalescence is slow). In the chronic forms of the disease, such as trachoma, he had had useful recourse to rapid dilation of the lacrymal passages, together with intranasal applications. In the purulent forms of conjunctivitis he made a daily application of a ten grain silver nitrate solution, neutralized by salt, and washed off with boric solution. Argyrol he also employs or else gives to the patient to be used at home. Mercuric bichloride (two grains to the pint) he used for irrigation in the early stages (and later, one grain to the pint), with the large bulb dropper, every fifteen minutes to a half hour day and night until acute stage is past. He applied ice pads constantly.

Dr. P. N. K. Schwenk said that his experience had been that all cases must be treated empirically. In simple ones he used weak solutions of nitrate of silver, boracic acid, and biborate of soda. Believing in the identity of granular conjunctivitis and trachoma (they differing alone in points of rapidity of development and severity of symptoms), he resorted to similar treatment modified to suit the existent conditions. Empirically, he had found the use of boroglyceride of great value in the treatment of diphtheric conjunctivitis.

Dr. Charles A. Oliver stated that the majority of cases of conjunctival disease were microbic in type, the clinical signs being in definite relationship with the amount of reaction to the preponderant acting germ. He considered that every ordinary conjunctiva, no matter how well cared for hygienically, was a harboring place for germ life—of both useful and harmful types: in fact, he considered that the membrane was, by this reason, kept in better condition, and made better able to withstand the attacks of injurious forms and coarse degrees of injurious bacterial colonization. He explained the difference between the scavenger type of germs and the serum consuming varieties. He showed how the anatomical relationships and peculiarities of structural formation rendered it more difficult for certain forms of bacterial growth (for example, the difference between related bacilli and cocci) to gain access to favorable resting grounds. He subdivided conjunctival disease in strict accordance with the clinical manifestations of the prevalent germs, and was thus able, by repeated bacteriological study during the course of the disease, to so regulate his therapy as to give the quickest and the best possible results in any given case. He had ceased to be disturbed as to prognosis in cases in which formerly he had had the gravest doubts as to useful recovery. Cleanliness of the parts, hibernation of germ life, destruction of the floral cells, with the least disturbance to the invaded faunal cell as possible, with protection to the most important contagious tissues, constituted his bases for therapy. He emphasized the relationship of the state of the patient's general health to the conjunctival condition at hand, this being particularly true in gross forms of disease, for example in Klebs-Löffler bacillus conjunctivitis in which he had obtained the most brilliant results by the early use of subconjunctival injections of antidiphtheritic serum; and in the scavenger type as a part of multiple infections of the mucous tract, in which general mucous therapy was a necessity. In his bacteriologic studies he had come to the conclusion that all conjunctival diseases are primarily the results of mixed infection; one or more types of germ life gaining the ascendency, and giving the clinical peculiarities to the individual case. In the destruction of the parts, he

had found that it was not the prevalent microbe which destroyed the organ, but that the particular microbic invasion so reduced the protective agents in their activities as to allow them to become the prey of the pyogenic forms of bacteria. He stated that it should not be forgotten how certain types of germ being in an involutional state from their ancestral forms having become exhausted in different mucous soils (those in the urethral canal, for example, giving rise to a chronic and hardly noticeable gleet) are placed in a new pabulum-field (in a fresh soil such as the conjunctiva) would soon have their successors become optimal in condition and virulent in action (coarse gonococcal conjunctivitis). Conversely, from experiments and studies that he had made, he had found that gross forms of gonococci flourishing in a good soil would when placed in previously used and hence practically barren soils, soon become involutional in condition, ofttimes monstrous in form and negative in action. He described the term "granular conjunctivitis," believing the conjunctival inflammation as merely secondary to reaction in the underlying microbic nestings of vegetable life with destruction of the adjacent faunal cells: resulting in cicatricial contraction and loss of the involved parts. He showed why the conjunctiva of the infant is less liable to injury from gonococci than that of the adult—giving a series of illustrative cases for explanation. He cited several examples occuring in the eye wards of the Philadelphia and Presbyterian Hospitals which well illustrated these differences.

Dr. L. E. Marter spoke of the injurious effects of chlorate of potash, if used in too great amounts. He gave a most interesting account of his experiences with the employment of varying strengths of solutions of permanganate of potassium in the different types of conjunctivitis, and inquired if the experience of the other members had been similar to his.

Dr. Samuel H. Brown stated that he wished to place upon record the almost constant plan of successful treatment of chronic cases of trachoma in the clinic of Dr. Conrad Berens, his chief—*i.e.*, by the use of fifty per cent strengths of boroglyceride. Incidentally, he had seen most favorable results in such cases from the local employment of graduated dosages of adrenalin—he having found this drug a most excellent adjuvant.

MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

Regular Monthly Meeting, held Monday, April 25, 1904.

The President, Wendell C. Phillips, M.D., in the Chair.

THE scientific business of the evening consisted of series of papers on the bacteriology and source of various food products and of the water supply of New York City.

Typhoid Fever and Oysters.—The first paper of the evening was by Dr. Cyrus W. Field, assistant bacteriologist of the Department of Health of New York City, who described some bacteriological observations relating to the transmission of typhoid fever by means of infected oysters. Oysters were infected with typhoid fever bacilli and then observations at regular intervals made with regard to the number of bacteria to be found in them. It was found that in healthy oysters the number of bacteria becomes gradually reduced so that on the second day there are only about half as many as on the first day, while on the ninth day practically all the bacteria are dead and failed to give colonies when plated for counting purposes.

Typhoid Bacilli and Salt Water.—During the experiments the oysters were kept in ordinary sea water and it was resolved to study the effect of this upon typhoid bacteria. It was found that if sea water became infected with typhoid bacilli, the number of the microorganisms became gradually reduced almost in the same proportions as had been noted in the observations made upon oysters. Where at first after contamination 200,000 bacteria were found to the cubic centimeter, after twenty-four hours only about 100,000 bacteria were to be found in the same space, and on the ninth or tenth day the bacilli had entirely disappeared. When the oysters were kept in contact with the same water conditions were not so favorable for the disappearance of bacilli as would usually happen with the ebb and flow of tidal salt water. Accordingly observations were made, changing the water every day and then it was found that after four days no bacilli could be found. The salt water itself seemed to act as a disinfectant under favorable conditions. These observations are in accord with those of Foote, made at New Haven in 1895, where he found that typhoid bacilli were destroyed at the end of ten days. If the water, however, in which the oysters were kept was cold, then the bacilli remained alive for from four to six weeks. In a word, cold inhibits the antiseptic action of salt water.

Dead and Dying Oysters.—Dr. Field made a series of observations also with regard to dead and dying shellfish, that is, clams as well as oysters. In these cases it was found that the lack of vitality in the animals served to make them an excellent culture medium for bacilli. Where, for instance, the original contamination showed from ten to twenty thousand bacteria to the cubic centimeter, this number soon ran up even to 100,000 whenever the oysters or other shellfish were dead, or even when they were not in normal good health. As the opposite happens, as a constant reduction of the number of bacteria is found when the shellfish are healthy, the importance of this factor in the transmission of typhoid fever must also be taken into account. During the course of shipment it is not unusual for a certain number of oysters to suffer so severely as to possess no vital reaction. If by any chance these were infected before the journey began, if they should be placed under water in the neighborhood of other oysters at the end of the journey, they would almost certain serve as a source of infection for oysters near them.

The Oyster in Typhoid Fever.—Dr. Walter Bensel, acting sanitary superintendent of the Department of Health of New York City, discussed the oyster as a possible agent in the transmission of typhoid fever in and around New York City. He said that typhoid fever occurred in New York City only in sporadic cases and evidently, therefore, not as the result of transmission through the water supply. Careful investigation showed that a considerable proportion of people who have been constantly in New York City for a month before coming down with typhoid fever were habitual drinkers of raw milk, or frequent eaters of raw oysters. There remained, however, a certain number of cases in which neither of these causes could be considered as active, but in which raw vegetables, or other sources of infection must be looked for. Besides, as the inquiries had to be made usually several weeks after the actual infection took place, patients frequently had forgotten with regard to important details, or were too ill to give the information and, as could well be understood, friends could not supply it satisfactorily.

Oyster Beds and Contagious Material.—An investigation of the source of oysters eaten in New York City had been undertaken by the Board of Health and

this served to show very well that there was every reason to suspect oysters as not only a possible, but a frequent source of infection. Dr. Bensel then showed by means of photographs the condition of affairs that exist on the Long Island coast of Long Island Sound, on the Connecticut coast of the Sound, on Staten Island and along the shores of the various "kills" in New Jersey from which oysters are collected and in the creeks of which oysters are stored for a time and go through the process known as fattening for the market. This process is always carried on in brackish water, usually at some distance from the actual oyster beds and consists in the irritating effect which more or less fresh water has upon oysters, causing them to absorb water and look fat and plump. Many of these creeks cannot fail to be contaminated by sewage from the banks, and as a matter of fact no special precautions are taken to avoid this.

Sewage Material and Oyster Fattening.—In many places on Long Island oysters are fattened on the lower floor of oyster houses along the banks of the stream, the level of this floor being slightly below that of the water, especially at high tide. It is not an unusual thing to find privies, barnyards, poultry yards and other such extremely undesirable sources of the worst kind of sewage material within a few yards, sometimes within a few feet, of the banks of the stream on which the oyster houses are built. There is not even the more or less questionable advantage of water flowing outward constantly, which might serve to carry off sewage material. There is a certain amount of influence of the tides in these creeks and this often delays the onward flow of water for hours at a time, thus allowing sewage material to become generally diffused in the water which is to serve for the purpose of fattening the oysters.

Oyster Barges and Sewage.—Along the Connecticut coast and in various parts of New Jersey oyster barges which permit a rather free inflow and outflow of water are used for the storage and fattening of oysters after they have been taken by means of the dredge. The Connecticut coast is in certain places where oysters are most plentiful and where the trade is briskest, rather thickly inhabited. Towns containing from twenty to fifty thousand inhabitants empty their sewage into streams which are used for fattening the oysters. In New Jersey not infrequently along the creeks in which oyster barges are anchored privies and outhouses are situated, the droppings from which are expected to be carried off immediately into the water. In one striking picture the outhouse for a factory was situated directly over the water within twenty feet of an oyster barge.

Railroad and House Drainage.—Some of the photographs exhibited showed the pouring of house drainage of various kinds from wooden troughs into the creeks in which the oyster floats were and it was very evident that the washings from the streets of many of the little towns are carried directly into the stream every time that there is more than an ordinary rainstorm. In some of the towns in New Jersey the sewers empty directly into some of the rivers in which oysters are stored often for weeks before being sent to market. Through these sewers factory drainage of various kinds finds its way to pollute and discolor the flowing water. At one point a number of oyster floats were anchored not very far from a railroad bridge across which are carried many trains every day. It is easy to understand that under such circumstances it will not infrequently happen that fecal and other excrementitious material will find its way directly into the water from the cars.

New York City Milk Supply.—Dr. William Hallock Park, the assistant director of the Research Laboratory of the Department of Health of New York City, described the sources of New York City's milk supply and discussed the method by which the Board of Health endeavored to improve the quality of this important food material. A city inspector by the privilege of the State Commission of Health is allowed to visit various parts of the State, wherever there is a report of possible contamination or of conditions likely to make the milk supply unhealthy. The milk supply of the City of New York, however, comes from distances on a radius of three hundred miles from the States of Pennsylvania, New Jersey, Massachusetts, besides New York itself. Milk comes from as far North as the St. Lawrence. Owing to the absence of funds for this purpose, inspection falls short of what it should be.

Inspection Work.—Wherever there is absolute neglect, farmers are warned and notices are sent to them giving general directions how dairies must be cared for, cattle housed, milking carried on and milk preserved. Special emphasis is laid on the necessity for immediate cooling of the milk, because it is well known that at low temperatures bacteria will not grow in milk, while at ordinary temperatures they grow luxuriantly. It is not so much the bacteria which get into the milk, especially if there is any sense of cleanliness at all, but the rapid multiplication of them that causes the danger with regard to milk. One method of enforcing this precaution is to insist with the railroad company that milk to be delivered in New York must be brought into the city at a temperature of fifty degrees. Not infrequently it happens that the railroad journey is not long enough to permit the milk to reach so low a temperature unless it is already cooled when it reaches the railroad companies. Accordingly the railroad companies insist on the farmer having his milk cool when delivered on board of the cars.

Insidious Dangers of Milk Contamination.—Dr. Park gave some examples of the insidiousness of the danger of infection from milk under circumstances where it may be least expected and may seem unaccountable. A series of cases of scarlet fever occurred in several schools, all of them supplied with milk from one source. The milk was supposed to come from an excellent farm on which all the sanitary precautions necessary for the delivery of good milk were maintained. It was found on investigation, however, that the demand for the milk of this farm had been so heavy that they had been unable to supply it entirely and had made up the deficiency in their own product by securing milk from a farm some distance away. The conditions on this second farm were as unsanitary as can possibly be imagined. In the barn in which the cows were kept there were no windows, the ventilation was very poor and dirt was everywhere. As a matter of fact, a septic condition was found to exist in one of the cows and some of this material had evidently found its way into the milk and was the source of typhoid fever.

Typhoid Fever and Milk.—Dr. Park also gave some examples of how easy it is for typhoid fever to contaminate the milk supply on farms where the well and the privy are not far from one another and where a certain amount of leakage is almost sure to take place. In this case the vessels in which the milk was stored are washed with the water and thus readily become contaminated and the milk stored in them becomes a veritable culture medium at times of an almost pure culture of typhoid bacilli.

Work of Milk Commission.—Dr. Park considers that these facts show the necessity for the existence of the milk commission which was organized and is maintained

because neither the State nor the city had sufficient money at command to secure proper inspection of the milk supply. Unfortunately there is not the response to the commission's effort on the part of doctors that should in all reason be expected from them. There is a complaint that certified milk is too dear and so it is not used except by the wealthier classes. On the other hand, inspected milk, though only slightly costlier than the ordinary unexamined milk, is utterly neglected. Even hospitals prefer to get ordinary milk in bulk, though they would have to pay only about one-third a cent a quart more to secure inspected milk. By inspected milk is meant that it is the product of farms and dairies in which the farmer takes all the ordinary sanitary precautions in order to prevent, as far as possible, the occurrence of all bacterial contamination and in which particularly, immediately after milking, the milk is made cold so as to prevent it from becoming a culture medium for the growth of micro-organisms. Undoubtedly the recommendation of this milk would encourage other farmers to take the precautions necessay and thus bring about a gradual improvement of the city's milk supply by the education of the farmer.

Water Supply and Typhoid Fever.—Mr. Henry E. Bramley, Chief Sanitary Inspector of the Department of Health in New York City, discussed the city water supply with particular reference to possible contamination with typhoid fever bacilli. The first part of his paper consisted of a historical review of New York's efforts to obtain pure water. The first reservoir, planned in 1774, was to cost £2,500 and was situated on what is now East Broadway, about Pearl Street. Later the Manhattan Water Supply Company was organized, which obtained its water from wells for distribution to the citizens. Of late years, of course, the main source of New York's water supply has been the Croton region, and there is no doubt that greater care and more frequent inspection is needed than has been the rule so far. The Board of Health are accomplishing much for the protection of the city, as may be understood from the fact that 18,000 cesspools were cleaned during the last year in order to prevent possible infection.

Legal Aspects of Watershed Control.—Harford P. Walker, Esq., assistant Corporation Counsel, of New York City, one of whose main duties is in connection with the water department of the city, discussed the legal aspects of New York City's control of its own watershed. He said the ideal state of affairs for the city would be for it to own several hundred feet of ground alongside the creeks and streams and lakes from which it drew its water supply. Already $7,000,000 have been spent in thus protecting the city water from possible contamination. It will cost $5,000,000 more to secure the rest. In the meantime care must be exercised and the assistance of the Board of Health asked in co-operation with the water department in preventing nuisances from proving sources of infection. Unfortunately the present state of the law with regard to contamination of public water supplies in New York State is not satisfactory for protective purposes.

Webster Act.—As the result of the cholera scare, something over ten years ago, the Webster act was passed by the legislature of New York and signed by the Governor, giving New York City the right to remove any nuisance that might exist as soon as the Board of Health adjudged it dangerous, the question of compensation to the owner being left for subsequent adjudication by the civil court. Unfortunately this act was to have its provisions enforced only for three years. At the present time New York City is practically dependent on the State Commission of Health for the abatement of nuisances and this has introduced so much red tape into the procedures necessary to secure and enforce the removal of nuisances as to make our present laws for the protection of water supplies of the community generally more or less abortive.

Impossibility of Securing Conviction.—Mr. Walker presented the nine reasons why it is practically impossible to secure a conviction under the present law. First, the violation must be reported to the local Board of Health and a second warning must be sent to the violator; second, after a certain time inspection must be made to see if there is improvement in the matter complained of; third, in the absence of improvement the matter must be reported to the State Health Commission, which, as the fourth step, sends an inspector, who must report the matter back to them. Fifth, the State Commission warns the local health authorities; sixth, the local boards of health must convene and take cognizance of the matter and only then (seventh) is it possible to go on with their approval and secure the conviction of the offender. The corporation counsels office drew up two bills for the purpose of obviating these difficulties, but owing to an unfounded suspicion that somehow they had something to do with grabs with regard to the water supply of New York, these bills were not passed. At the present time it would seem eminently advisable to secure the repassage of the Webster act, by which the city could remove nuisances whenever they seem to become a menace to health and then pay such damages as should be adjudicated in the case.

State Commission of Health.—Dr. Daniel Lewis, the State Commissioner of Health, in discussing the subject of State control of water supply, said that the ownership of the Croton watershed, as far as is necessary to protect New York City's water supply, is being gradually acquired. He denied that the present laws cannot be enforced, since, in a number of cases, nuisances have been abated and other cities throughout the State are well satisfied with what they are able to accomplish, when they are really determined in the matter. Last year a number of infractions of the present law were reported to the Commissioners of Health. Within fourteen days, investigations were begun. Within twenty-one days reports of inspection were filed and if these cases had been prosecuted, as they should have been, undoubtedly greater respect for law would have been inspired, and it would have been easy by simple warnings to secure the abatement of other nuisances. As it is, for some reason or other the cases were not prosecuted and this laxity reflects back and makes conditions worse in the watershed.

The Other Side.—Dr. Lewis considers that the other side of the question should be considered, and that the mere fact that people are living along the watershed should not be supposed to compel them to take expensive measures for the protection of others without some due compensation. No allowance is made for improvements effected and it must not be forgotten that the present discussion is evidently not meant to apply so much to existing conditions but to future possibilities. If by proper treatment the people themselves can be got to cooperate with the health authorities then much can be accomplished without appeal to legal procedure.

Dr. Bensel, in closing the discussion, said in answer to a question from the president as to whether any of the streams in which oysters were placed for fattening purposes were ever used for drinking by the people who lived along the banks, that practically all of these streams were in direct connection with the waters in which the oysters grow, as indeed they must necessarily be for the dredgers to bring oysters up in them and that consequently because of mixture with salt water during

the inflow of the tide most of them were brackish and therefore undrinkable. This, however, actually added to the danger as far as oysters were concerned, since, if any of the streams were used for drinking purposes the inhabitants along the banks would be much more careful with regard to the keeping the water free from sewage contamination. At the present time no attention seems to be paid to this matter and it does not seem to be considered as of any importance.

Dr. William H. Park said that in the matter of milk inspection and the improvement of the milk supply of New York City, the New York State Commissioners of Health had been very helpful and far from putting any obstacles in the path of the special milk commission or of the city Board of Health, they were ever ready to accord inspection privileges.

Dr. Darlington said that the city was indeed to be congratulated on the active workers of the Board of Health whose work he was just beginning to appreciate properly, while the State Commission of Health deserved all praise for hearty co-operation.

Prosecution of Quacks.—Mr. Andrews, of the Medical Society of the County of New York, then made a report with regard to some recent prosecutions of persons who are practising without a license or engaged in the sale of nostrums that brought them without the pale of the law. The Society had endeavored to expose one Philip Koch who posed as the brother of Robert Koch, and pretended that he was a collaborator with the distinguished German bacteriologist in the invention of a so-called lung cure. This Philip Koch had gone to England during the session of a tuberculosis congress, some years ago, and having waited until Robert Koch registered, signed his name immediately below and then secured a photograph of the two names to be used for advertising purposes. His exposure had broken up his business, though the fact that he employed two registered physicians prevented his active prosecution. As the result of the Society's work, however, he is now behind prison bars for the violation of the Practice of Medicine Act in the District of Columbia. The Society has recently found a diploma mill in New York, run by one Dr. Conrad, who has come to be known in medicolegal circles as Conrad II. Dr. Conrad was the president, secretary, office boy and faculty of a medical school. For $100 a diploma in osteopathy was given, and for $550 a diploma in medicine. He had two branch establishments in the city. From papers found in his possession at the time of his arrest it is evident that he drafted the osteopathy bill, which gave so much trouble to the medical society at the last session of the legislature.

CONGRESS OF INTERNAL MEDICINE.

Twenty-first Session, held in Leipsig, April 18, 19, 20 and 21, 1904.

Arteriosclerosis.—Marchand classifies under arteriosclerosis all those arterial changes which lead to a diffuse or nodular thickening of the walls, especially the intima, and which are usually followed by fatty degeneration, sclerosis and calcification. The process is chiefly a degenerative one, though inflammatory and productive changes are common. Simple hypertrophy of the media and syphilitic arteritis of the medium-sized and small vessels should not be included, as they form distinct and separate processes. In arteriosclerosis the connective tissue growth is mainly hyperplastic and the increase of elastic tissue occurs by a splitting off of new lamellæ from the hypertrophied musculo-elastic layer of the aorta or the elastica interna of the other arteries. Arteriosclerosis results from the mechanical factors at work during abnormal vessel-strain; these factors are caused by increased filling of the vessels and temporary or permanent rise of blood-pressure. But added to this there is always some local or general weakening, induced by general malnutrition, toxic or infectious processes, hereditary tendency, influence of temperature, etc. A sclerosis marked by degenerative and inflammatory changes above all in the media and adventitia of the thoracic aorta is caused in many cases by syphilis and the name productive mesa-ortitis is often applied to this condition. The first signs of arteriosclerosis show themselves in the elastic fibers of the musculo-elastic layer of the interna and of the media of the aorta and in the elastica intima of the medium-sized and smaller vessels. The superficial atheromatous degeneration of the intima of the aorta in young individuals is already part of the process. Secondary to the degeneration of elastic fibers there will follow a compensatory, circumscribed or more diffuse hypertrophy of the intima. If the arteries of the extremity are found diseased, it does not necessarily mean that the aorta or other vessels are involved in the process. Not rarely arteriosclerosis is complicated by hypertrophy of the left ventricle owing to increased circulatory resistance and renal sclerosis. The importance of splanchnic arteriosclerosis in bringing about cardiac hypertrophy has been overestimated.

The subject arteriosclerosis was also selected by Romberg, who says that the most deleterious effect of the vessel-lesions upon the circulation is the loss of elasticity. The impediment caused by this and by the narrowing of the lumen is then compensated for by aneurismatic dilatation. More work is rarely required of the left chamber since all vessels are hardly ever affected; in advanced sclerosis of the splanchnic vessels and of the aorta without aneurism there is, however, a moderate hypertrophy. In 90 per cent. of uncomplicated cases the blood-pressure is normal. The most common complicating lesions are seated in the heart, but coronary sclerosis is present in only a certain percentage where there is angina pectoris and cardiac asthma. The remainder suffer from the non-typical signs of a chronic insufficiency. In the kidneys there is a tendency toward chronic interstitial changes, which, when fully developed, will again react upon the heart. Cerebral signs often suggest neurasthenia at first and may later pass over into a psychosis. Involvement of the sensory organs and of the gastrointestinal tract is less frequent. In certain cases the vessels of the lower extremity are principally involved, giving rise to the interesting symptom-complex known as intermittent claudication. Important etiological factors in general are bodily exertion and nervous influences, beside these, alcohol, tobacco, coffee and tea are injurious, chiefly owing to the fluctuations in blood pressure which they bring about. Beneficial agents are rest rather than exercise, sufficient sleep, change of climate, indifferent or saline springs, restriction but not abstinence from alcohol, coffee, tobacco and tea. The diet should be simple and regular, without excessive amount of meat and spices, and fluids need not be cut off unless there is a tendency toward edema. Attention to the stool is a matter of prime importance. In the early changes, especially in the initial cerebral symptoms, in angina pectoris, etc., iodide of potash is of signal service, yet this drug is unable to correct anatomical changes, so that too much should never be expected. Small doses (three times daily half a gram) are best. There are no other specific remedies, though saltpetre has been recommended. In treating the kidneys, the attention should be

directed toward the heart; here the dangers of increasing the pressure are not as great as generally believed, but excessive rises must be avoided. In beginning stages of cardiac insufficiency and during convalescence from severe disease, mild carbonated baths are often excellent.

Practical Importance of Measuring the Blood-Pressure.—In estimating the blood pressure, one must distinguish between temporary and permanent changes. Thus, temporary falls are common in acute infectious diseases, especially tuberculosis and after tuberculosis injections. In valvular disease, chloralhydrate reduces the arterial tension only slightly, and can thus be given for days without bad effects. A transient increase in pressure is seen after emotional disturbances, and after the use of tobacco and alcohol. Bodily exertion will raise the pressure much higher after the use of alcohol than before. On the other hand, permanent high tension is common in arteriosclerosis and chronic interstitial nephritis. In some cases of this kind, the red cells are increased up to eight to eleven million, and as many are found in arterial as in venous blood. Increased pressure with diminished number of red cells was found only in nervous individuals. In conclusion, F. Geisbock demonstrated an interesting case of general plethora with increased pressure but without arteriosclerosis.

Experimental Arteriosclerosis.—The effects of constant change in pressure is best seen in the experiments of Erb, Jr. Three drops of adrenalin 1-1000 were injected daily into the ear-vein of rabbits; after six weeks the vessels showed diffuse or nodular thickening with calcification. Another animal received 16 c.c.m. of adrenalin during two months; the autopsy revealed an apoplectic focus in the brain, aneurism of the aorta and thickening with calcification of the remaining vessels. Fatty degeneration could not be found with the microscope, but the intima was strongly proliferated.

Blood-Pressure in Arteriosclerosis.—High pressure always suggests arteriosclerosis, though not always present in the disease. Gröbel goes so far as to state that it always signifies the advent of an interstitial process in the kidneys. The treatment calls for a regular mode of life and careful avoidance of all measures which lead to fluctuations in pressure. There is as yet no remedy which permanently lowers the pressure—not even the iodides or nitrates act in this direction. In cardiac insufficiency, the speaker gives small doses of digitalis even where the pressure is high. Massage, baths and gymnastics are frequently indicated if employed judiciously.

Arteriosclerosis and Life Insurance.—In looking over the records of life insurances, Bahrdt finds that 22 per cent. of patients die of arteriosclerosis or its complications, while the mortality of tuberculosis is only 7 per cent. Arteriosclerosis seems to be increasing during the last two years.

Pancreatic Lesions in Arteriosclerosis.—Hoppe-Seyler reports 16 cases of extensive lesions in the pancreas incident to arteriosclerosis; among these, six with marked glycosuria. In some, the vessels were so altered that thrombosis and obliteration were common; the parenchyma generally shows a growth of connective tissue which extends irregularly between the acini and does not spare the islands of Langerhans. There seems to be a definite relation between the severity of the glycosuria and the amount of tissue destroyed.

Method of Measuring Diastolic Blood-pressure.—The usual instruments generally register only the systolic pressure and a method for measuring both systolic and diastolic does not as yet exist. Strasburger believes, however, that the instrument of Riva-Rocci may be employed since the diastolic pressure may be recorded when the radial artery becomes smaller with gradually increasing compression of the brachial. The importance of measuring both is evident since their difference corresponds to the height of the pulse. By dividing this "pulse-pressure" by the maximum pressure, a "blood-pressure quotient" is obtained which will give an idea of the relative work of the heart, the condition of the vessels and the blood-supply of the tissues—factors which generally can be obtained only by opening the arteries.

Discussion on Arteriosclerosis.—Kisch refers to the frequent coincidence of arteriosclerosis with limomatosis. Such cases often die of cerebral hemorrhage; the warning symptoms are bradycardia and irregularity of the pulse. Klemperer has seen arteriosclerosis very often among physicians. The lime contents of the blood is irrelevant, milk is desirable, alcohol injurious. V. Noorden believes increase of pressure is often high and the cause of many disturbances. He recommends a five per cent. alcohol solution of nitroglycerin up to 10 milligrams daily. The lime-metabolism does not differ materially from the normal, hence calcareous food need not be interdicted. Schott has seen arteriosclerosis in disease of the aortic valves before the age of twenty. The blood-pressure is often normal or subnormal. The use of nicotine seems to be a very important etiological factor. According to v. Jaksch, the neurasthenic symptoms are a result of the disease. He warmly recommends carbonated baths, sodium iodide in large doses once or twice weekly, with food poor in salt. Digitalis is dangerous and nitroglycerin should be employed with caution. A. Frankel states that arteriosclerotic angina is often secondary to acute infectious diseases, but is never observed in children. Obstruction and thrombosis of the mesenteric vessel often gives a characteristic symptom-complex marked by intermittent abdominal colic. Digitalis and morphine are most serviceable for cardiac asthma or arteriosclerosis, but should be used carefully in angina pectoris. Carbonated baths are also risky, since they may increase the pressure.

Examination of the Heart.—The phenomenon of diastolic pulsation of the chest wall of cases of mediastino-pericarditis which had been subjected to cardiolyris has been the object of special study by Brauer. By constructing a kymograph which definitely registers the curve, he could determine that the up-stroke does not correspond exactly to the diastole, but occurs somewhat later. An accidental sound which was formerly regarded as a bone-sound could also be heard despite the fact that the sternum had been resected, so that it is probably an auricular or split second sound. Typical diastolic pulsation is also seen occasionally in cases of shrinking kidney with beginning decompensation, but the systolic portion of the curve is different.

New Method of Examining the Venous Pulse.—By means of Mackenzie's polygraph, Deutsch could register the venous pulse, liver pulse, and apex-beat synchronously with the radial pulse. In the jugular curve, a carotid wave was found; before this a presystolic auricular, and behind this a delayed, systolic ventricular wave. The relation in size between the last two waves gives an idea as to the stagnation in the right heart, the degree of tricuspid insufficiency and the effect of contraction of the right ventricle and auricle. A purely ventricular (systolic with one wave) venous pulse gives a very grave prognosis since it shows that the over-dilated auricle has ceased to contract.

Determining Size of Heart.—Orthodiagraphy is the only absolutely safe and accurate method of determining the size of the heart, except where there is much enlargement toward the left. De La Camp has also had

good results with deep percussion combined with palpation; in three-fourths of the cases the error is not more than three-fourths centimeter. Auscultatory percussion is inaccurate, since heart-shaped figuures can be obtained almost anywhere on the chest, and after death, where the heart has been removed.

Vessels in Typhoid.—In typhoid, Wiesel commonly found the tunica media of the vessels affected. During the height of the disease all the vessels of the body may show an increase of intramuscular connective tissue, atrophy of the smooth muscular fibers, and changes in the elastic fibers. The latter resemble the lesions found in myocarditis after infectious diseases.

Circulatory Organs in Typhoid.—In 38 cases of typhoid, Ortner discovered a distinct accentuation of the second aortic sound during a certain phase of the disease. The real cause of this is probably a relaxation of the peripheral superficial and deep vessels which also shows itself in dicrotism, pseudocelerity and pulsation of the small arteries. This relaxation would normally bring about a fall in blood pressure; since, however, the pressure was found normal a compensatory contraction of the splanchnic system probably occurs where the second aortic sound is not increased and an increased activity of the heart where it is. Death in typhoid follows from vasomotor paralysis and severe changes in the heart-muscle. A hitherto undescribed symptom is dicrotism of the capillary pulse. Similar conditions are found in influenza, miliary tuberculosis, pyemia and secondary lues.

Studies on Heart Action.—In a patient who had been subjected to an extensive thoracoplasty, so that the left half of the heart was covered only by skin, A. Hoffmann could induce extrasystolic contractions by means of the galvanic current. Other changes in rhythm occurred under the same conditions as in frogs and other mammals.

Exploratory Puncture of the Skull.—Neisser warmly recommends the exploratory puncture of the skull by means of electric drill. With care the dura is not injured and the large blood vessels are avoided. The aspiration of "old blood" will speak for extra or intradural hemorrhage, clear, albuminous fluid for cysts and pus for abscess. In cysts, simple aspiration may bring about a cure. In abscesses with doubtful location, aspiration may decide in which lobe of the cerebellum or if in the temporal lobe. The method is not absolutely harmless, but will often be indicated.

(To be Continued.)

BOOK REVIEW.

ROENTGEN RAY DIAGNOSIS AND THERAPY. By CARL BECK, M.D. D. Appleton & Co., New York and London.

THIS work forms an addition to the number of text-books which have already appeared on this subject, but is supposed to differ from them in that it treats the field from a strictly clinical point of view. Consequently we find about two-thirds of the book given over to diagnosis of lesions in various parts of the body by the aid of the X-rays. This section is embellished by a large number of excellent illustrations original with the author. Considering the limitations of the half tone process, they are very good and in a work of this kind form one of the most important adjuncts in elucidating the text. The introductory section is devoted to the subject of technic and apparatus and a number of the author's devises are described. It seems that more attention might have been given to this section, as considerable doubt exists in the minds of most practitioners as to the necessary apparatus and its application. At the end of the book is appended a discussion of the other forms of light treatment, and in this the author states that in his opinion the Finson cannot, in its present stage of development, compete with the Roentgen method in value. It seems to us, however, that the status of these various agents is still too unsettled to admit of drawing any definite comparisons; it is probable that a limited field will be found for each. On the whole, the book may be regarded as an excellent introduction for the general practitioner of the value of this therapeutic agent, which has not yet been sufficiently recognized. He can feel, moreover, that the matter presented is based on painstaking research, for the author is an acknowledged authority in this field, was one of the earliest investigators in this country of the method and has most extensive personal experience.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

A TEXT-BOOK OF PHYSIOLOGY. By Dr. Isaac Ott. 8vo. 563 pages. Illustrated. F. A. Davis Co., Philadelphia.

THE PHYSIOLOGICAL FEEDING OF INFANTS. By Dr. Eric Pritchard. Second edition. 8vo, 201 pages. W. T. Keener & Co., Chicago.

SURGERY OF THE HEART AND LUNGS. By Dr. Benjamin Merrill Ricketts. 8vo, 510 pages. Illustrated. The Grafton Press, New York.

A TEXT-BOOK OF HUMAN PHYSIOLOGY. By Dr. Albert P. Brubaker. 8vo, 699 pages. Illustrated. P. Blakiston's Son & Company, Philadelphia.

TEXT-BOOK OF PATHOLOGY. By Dr. Joseph McFarland. 8vo, 818 pages. Illustrated. W. B. Saunders & Co., Philadelphia, New York and London.

THE PRACTICE OF OBSTETRICS. By Dr. J. Clifton Edgar. Second edition. 8vo, 1153 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.

NORMAL HISTOLOGY. By Dr. E. K. Dunham. Third edition. 8vo.. 334 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.

MENTAL DISEASES. By Dr. T. S. Clouston. Sixth edition. 12mo, 738 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.

TRANSACTIONS OF THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION. Volume 16. 8vo, 468 pages. Illustrated. Published by the Association.

THE DOCTOR'S LEISURE HOUR. By Dr. Chas. Well Moulton. 8vo, 352 pages. Illustrated. Saalfield Publishing Co., Chicago, Akron and New York.

PRINCIPLES AND PRACTICE OF GYNECOLOGY. By Dr. E. C. Dudley. Fourth edition. 8vo, 771 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.

HANDBOOK OF PATHOLOGICAL ANATOMY AND HISTOLOGY. By Drs. Francis Delafield and T. Mitchell Prudden. Seventh edition. 8vo, 885 pages. Illustrated. Wm. Wood & Co., New York.

THE MEDICAL EPITOME SERIES—SURGERY. By Drs. M. D'Arcy Magee and Wallace Johnson. Edited by Dr. V. C. Pederson. 12mo, 295 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.

A SYSTEM OF PRACTICAL SURGERY. By Drs. von Bergmann, von Bruns and von Mikulicz. Translated by Drs. Wm. T. Bull and J. B. Solley. Third volume. 8vo, 918 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.